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New Demand Not So Large

Mills Still Under August Momentum

Pig Iron Stocks Less—Eastern Market Shows Most Activity

September has not yet brought such a scale of buying in iron and steel products as that of late July and early August, which made last month the banner month of the year in steel works and rolling mill operations. The August performance may have been due to one of the moderate waves in demand which, throughout 1911, have alternated with the troughs—the short periods in which the market has halted.

It is hard for the trade to be satisfied with conditions under which the most certain thing about rolling schedules is that for a given week they can only be made up when the week arrives. The uncertainty about prices is one reason for this; there is also the fact that many consumers of steel have no assurance of continuing their own present rate of operations.

As for some weeks, structural steel work is of good volume. This week the principal contracts reported are 4000 tons for the Boston & Albany bridge at Worcester, Mass.; 3500 tons for the Aeolian Building, New York; 3800 tons for the city hall at Cleveland, Ohio; 3000 tons for spillway gates and valves for Panama, and 2000 tons for the New York Central Railroad, in addition to a large number of jobs running from 200 to 1000 tons, the East leading in the activity. There is not enough business pending, however, to encourage high hopes for the winter—a fact that may explain the eagerness of large fabricating interests in going after recent contracts.

Railroad buying shows further shrinkage, with little promise of any change for the better. Rail sales are insignificant, including 2100 tons to the Pittsburgh & Lake Erie and 1800 tons to the Pennsylvania Lines West. The Canadian Government has inquired for 10,000 tons for the Hudson Bay Railway.

Continued weakness is shown in tin plates, sheets, wire products and merchant pipe; in none of the last three lines has the buying this month been up to that of August. For tin plates both months have been of the off-season period, but new business has been done at $3.60, Pittsburgh, or 10 cents below the basis of existing contracts.

In the Pittsburgh district sheet bars have been quoted recently at $2 a ton below the $22 basis at which the majority of mills have aimed. At the same time the "spread" between the prices of sheet bars and sheets is probably less than has ever been known. In Eastern Pennsylvania a tentative inquiry has appeared for a three years' billet supply of an interest using a minimum of 20,000 tons a year.

The Eastern pig iron market is more active and has a better tone than is indicated by reports from

Chicago and the Central West. Buffalo has made a number of sales for Eastern shipment and in New England, New York and New Jersey 25,000 tons of pig iron, chiefly foundry grades, is under inquiry. Buffalo and Eastern Pennsylvania producers are apparently firmer than sellers in Central territory.

Alabama pig iron stocks were reduced 10 per cent, or by 26,000 tons, in August. Eastern Pig Iron Association figures, as well as those of the Buffalo district, show slight reductions also. While the statistical position is thus tending in the seller's favor, the market for Southern iron is not so strong, and in some quarters the past week has shown more effort to get business, the $10 basis for No. 2 prompt iron at Birmingham still persisting.

The United States Steel Corporation's steel works operations this week are scheduled at 75 per cent. of capacity, which is slightly below the recent rate. The pig iron stocks of the corporation only increased 18,000 tons last week with the steel plants shut down for Labor Day. As these stocks have been for some time at a minimum, two additional blast furnaces are being blown in—one Shoenberger and one Donora, both operated by the American Steel & Wire Company. Their resumption confirms reports of large August bookings in wire products. The corporation's statement of unfilled orders on August 31, showing a gain of 112,000 tons over the total on July 31, is to be taken in connection with the heavy shipments of August and the fact that June and July made a total gain of 471,000 in the tonnage on the books. Exports have much to do with this showing, foreign business for some time having been but little short of 20 per cent. of the total.

After Effects of Co-operation in the Steel Trade

The steel trade has been so long accustomed to so-called official prices for rolled material that it finds difficulty in adjusting itself to the conditions attending an open market. Frequently the prices actually made in the past few weeks have been referred to as departures from a level which sellers are assumed to be maintaining. While any control of the market through co-operation among manufacturers has disappeared, as is well known, this continued recognition of standards from which it is to be inferred the market has at times slipped away is proof of the influence still exerted by the good understanding among manufacturers arrived at after the panic of 1907. While profits have been reduced, it is not claimed that the manufacturers of finished material have gone to the limit of their ability to sell at a profit, as has plainly been the case in the pig iron market; yet, in the midst of conditions which might be expected to bring out sharp competition, actual market transactions as reported week by week show only fractional reductions from the basis announced by the leading interest early in June.

It may be that the American Iron and Steel Institute's Committee on Improvement in Methods, which was the court of resort when one steel company felt that a competitor was not living up to the understanding, did its work so well that its influence is still strongly felt in the trade. There is no doubt, moreover, that the lines of operation of the respective companies, which have become pretty well defined in recent years, are receiving more or less recognition. One of the things claimed for the policy of co-operation was that it kept the various steel companies "within their own particular bailiwicks." This expression no doubt meant in part that there was a certain regard for territorial lines and that one steel company would not go far afield in order to take business naturally tributary to the plants of another. It may have meant also that one manufacturer would not cut prices in order to get the trade of a buyer most of whose requirements had been regularly supplied by another manufacturer. It is evident that this latter feature of the steel trade—the fact that a buyer is apt to place his orders with the company he has been in the habit of dealing with—gives continued momentum to a quasi-co-operation in this present period of open competition.

Another factor which cannot be exactly measured, but which without doubt has an influence, is that the buyers of steel are not ignoring the effect upon their own products of drastic cuts in the products of the rolling mills. The agricultural machinery trade, for example, would find an insistent demand for an important reduction in prices of implements and harvesting machinery if it were able to buy bars at a material reduction from the prices prevailing last year. Similar considerations may have prevented buyers in other lines from aggressive attempts to break the market for iron and steel products.

There should be no omission, in accounting for the absence of demoralization in the steel market, to give full weight to the amount of business flowing in upon the mills. With all that is said about the absence of railroad buying and the failure of demand to occupy our increased mill capacity, the continuous exhibition of buying power that has marked the past few months of open competition should by no means be underestimated. It may be well that the steel companies learned, under the regime of live and let live, to be content with less than full rations. It is plain, at all events, that none of them, in spite of occasional evidence of special aggressiveness, has determined on a policy likely to bring on any serious unsettling of values. Something might be said, in this connection, of the sustaining influence of the Lake Superior ore situation, but that is apart from the present purpose. What is evident, aside from all other considerations, is that the steel trade has acquired a new habit in the past four years, and is not hurrying to break away from it.

Electrification at Lake Superior Mines

Compared with the advance made elsewhere in the electrification of mining properties, there has been until lately relatively little progress among the operations on the iron and copper ranges of upper Michigan. Recent tendencies are, therefore, of considerable interest, from the fact that they indicate important developments in this direction within the next few years.

The entering wedge has usually been electric haulage underground, followed by the use of electric motors in the shaft and crusher houses, for surface tramming and on the stock piles. In this the Cleveland-Cliffs Iron Company, Ishpeming; Corrigan, McKinney & Co., Crystal Falls, and the Oliver Iron Mining Company, Iron Mountain, have been among the pioneers. Electric hoists, both for cages and skips, have naturally followed, the leaders in this respect being the Penn Iron Mining Company and the Cleveland-Cliffs Iron Company. In working out their systems, however, the methods of the two show a radical

difference; for, while the former manifests a preference for rebuilt hoists of early standard design working with heavy fly-wheels and clutches, the latter is introducing the German Ilgner system of control, in which current from the generating plant is led to the hoist motors through a fly-wheel motor generator set that balances the load. The latter plan was first tried out in the upper Peninsula, with marked success, by the Winona Copper Company, Winona, Mich., and has recently been investigated by the Cleveland-Cliffs Iron Company, whose engineer made a tour of European plants in which the system had been installed. A third distinct line of demarcation is to be found in the plans of the Calumet & Hecla Mining Company for operating the hoist motors in groups directly from steam turbine generating sets, the latter being regarded as sufficient balancers in themselves.

The companies named above have also been prominent in the trying out of motor-driven pumps for mine drainage. A notable installation is that of the Penn Iron Mining Company, at Vulcan, Mich., which consists of a concrete station at the 1,200-ft level enclosing two 8-stage turbine pumps, electrically operated, for raising water to the surface. The Cleveland-Cliffs Iron Company, on the other hand, is trying the experiment of using a piston pump, motor-driven, to operate against the unusually high head of 1,000 ft., the idea being to secure greater efficiency than is obtainable from a rotary pump.

For operating compressors of standard piston types motors are beginning to come into use, and on long lines the use of small electrically driven compressors as boosters will be quite general in future. Turbo-compressors do not seem to be as well adapted to the requirements of mining work as those of the reciprocating pattern, but if their efficiency for this service can be demonstrated there ought to be a considerable field for them here.

In the surface plants, particularly of the copper country, motors are finding wide application, being used to operate the valve gear of steam stamps, trommels, jigs, classifiers, concentrating tables, buddles, crushers, rolls, regrinding mills, water and sand pumps, elevators, conveyors, tailings wheels, repair shop machinery, etc. The Calumet & Hecla Mining Company has gone into this more extensively than any other. It is also working out very thoroughly the matter of electric control.

Electricity naturally is used very largely for lighting, also for firing blasts and for signal systems. The possibilities of electric drilling are being given considerable attention, but there appears to be a decided lack of definite information on this subject.

A start has been made toward the utilization of water power for generating electric current to be employed in mining operations. The first important plant of this kind was that constructed by the Penn Iron Mining Company in the vicinity of Republic, Mich., followed recently by another of larger capacity at Loretto which has attracted a great deal of attention. Last year the Cleveland-Cliffs Iron Company put in operation a small hydro-electric plant on the Au Train River and is constructing one of considerable size on the Carp River between Negaunee and Marquette. The greatest interest, however, is generally taken at present in the development being carried out at Twin Falls on the Menominee River by the Peninsula Power & Development Company, Iron Mountain, Mich., which will supply current as needed to the mines in that vicinity. There are at numerous points on the iron ranges opportunities for similar plants; and it is probable that in the not far distant future they will almost entirely displace steam units for regular service.

Steam engines or turbines will find a place, however, as auxiliaries to the water power plants; and some of those at present operated will be held in reserve for that purpose. Two new steam turbine units were purchased by the Cleveland-Cliffs Iron Company specifically with this end in view and are now running parallel 17 miles apart, serving the part of the company's transmission system already completed.

Piece-Rate Cutting

Few subjects are of more general interest to manufacturers than systems of wage payment, and few parts of this subject are more vitally interesting than the justice or injustice of the widely prevalent custom of piece-rate cutting as carried out in every factory in the land. There are times when the workman knows there is some justice in the cut, but there are far more times when the apparent injustice of it all strikes a bitterness into his heart which rankles there for a long time. From the ordinary workman's standpoint, cutting rates is usually considered unnecessary and is done only to increase the profits for a grasping employer. Yet it is quite possible, and, in fact, it can be shown that with the world and its people as they are to-day, that readjustment of piece prices is often necessary and is not always unjust.

In the first place, all will admit that no one can do exactly as he should wish to do because we are all subject to certain natural laws—because we are human and deal with other human beings. We daily make sacrifices for our children; we have clear days and stormy, we have sickness and health. We ought not to complain when it rains, because rain, disagreeable as it is, is necessary to our lives. We have to accept compromises in practically everything we do. Let us keep that in mind.

Admitting the unfortunate custom of piece-rate cutting to look blameworthy from the standpoint of the producer, let us imagine a case in which the management of a factory decided to try out the success of a system in which everything was on piece-work and a promise was made not to cut a single price, no matter how much money a workman made. It can be conceded that that is the way most producers would wish to have the system arranged.

The first visible effect of such a change would be to increase the total factory daily output. The increase might be as much as 25 per cent., or more, with the same working force, equipment and floor-space. This increase in productive capacity would undoubtedly be very acceptable to any manufacturer. With the workmen, however, it would not be so pleasant as would at first appear, for a condition of which little is known would immediately show up glaringly, and on the first payday following about 50 per cent. of the hands would be exceedingly unhappy. The cause of this unhappiness with one-half of the workers would be that they had been able to earn only a little more than before, whereas the other half had most of them earned half as much again, for no one will attempt to deny that some piece-prices have been

set more accurately than others; also that some workmen can do twice the number of pieces than their fellow workmen. The moment, then, that the new system takes effect all these things will show up; some will earn big wages, others will earn very little more than under the old conditions. And there is nothing to do about it, because the company has agreed to stick by the prevalent rates, which is just what it was asked to do.

The only thing left for a workman to do, then, is to seek employment in some department where he is told one can make higher wages than he can at his present work. This he tries to do, with more or less success. Now it will be seen that trouble will begin for the manufacturer. Everyone, of course, wants the best paying jobs; no one wants the hard jobs and feels imposed upon if he is asked to take one. That there always will be both hard and easy jobs will not be denied. It may be that one department in the factory has its piece-prices more correctly adjusted than the others, and after the change this department will find great trouble in getting men, as the latter will all flock to the other departments where it has been rumored that the prices are high, and where therefore a larger day's pay may be earned. What a disorganizing influence a condition like this brings about, only those who have employed help can fully understand.

Let us suppose, however, that a man is having his house painted at so much a day, and that when it was only half finished the painters all quit and went to painting his neighbor's house, because he agreed to pay them 25 cents more a day. It can be seen in this example the good effect which stability of prices has and just why a manufacturer dislikes to start anything which will upset the wage scale in his own shop. In self defense he cannot afford to do it, at any rate just at present.

But there is still another obstacle. On certain articles which he makes, of which perhaps he manufactures great quantities and on which the margin of profit is quite small, there is a great deal of competition. Each year he has to quote a lower price in order to get the business, and it is quite clear that a time will come when he must quote a price which will bring him no profit unless he reduces his cost of manufacturing. One way of doing this is to substitute automatic machinery for hand work; another is to cut the price paid for work. Evidently, if he has promised not to cut prices, he must either discontinue manufacturing, or put in automatic machinery, either of which actions will be felt by the help.

Any manufacturer must look a long way ahead and lay his plans with great caution and only after considerable study. With such obstacles opposing the straight "no cut" piece-work system he is bound to go slowly. He realizes full well the benefits, but he likewise appreciates the dangers. For example, it is clear to him that he cannot be the only one to install the system; his competitors must immediately do likewise, or he will lose to them the greater part of his business, because of his promise not to cut piece-rates. His competitors have the advantage because they have made no such agreement with the help. It is acknowledged that we can have no world's disarmament of nations until all the nations agree to it.

Realizing the evils of rate-cutting, the manufacturer has devised the "premium" system, which is really a distinct advance in the direction of better conditions for the workingman. With piece-work in which a cut follows the earning of more than a certain day's pay, the workmen saw to it that he was not punished in this way for his efficiency. With the uncertainty which exists as to the accuracy of piece prices, no factory owner dares to allow straight unlimited piece-work. What he has done, however, is this: He has invented the half and half premium system, which is the same as saying, "You are capable of doing more than you do, and it has been my custom to cut you when you did it. If I was sure my prices were all right, I'd say go ahead and earn all you can. Since you can do more and want to earn more, and since I am not sure of my prices, I'll tell you what I'll do. I'll share half and half with you what you can make over your old day rate."

The world is full of apparently unjust conditions, but general conditions are far better than they once were. Yet it is found that a great many things cannot be changed all at once. This life is full of compromises.

Correspondence

Labor and Lower Prices for Commodities

To the Editor: Referring to page 504 of *The Iron Age* of September 7, I have read with interest your answer to Mr. Thornton on "Labor and Lower Prices for Commodities," and the facts you state ought certainly to be convincing. But it seems that you have omitted one argument which could be used with telling effect to explode the untenable theory that lower price widens the market and thus benefits the laborers, and I suggest this argument as follows:

If prices have to be lowered on account of reduction in the duties, the consumption of home-made products will not be increased because the importation of foreign material will keep it limited. In connection with this I beg to suggest that the following self-evident truth should not be lost sight of by the framers of the tariff. The free traders constantly repeat that lowering the duties will break up trusts. Now the largest factories of combinations of capital as, for instance, the United States Steel Corporation, are located so far inland that they are protected from competition with foreign goods by the freight from the coast. The independent companies are mostly located further east. The last named would therefore be most hurt by increased importation, and the combinations of capital would then have the field more to themselves.

The free traders keep on telling that lower prices caused by lowering of duties will make living cheaper and thus benefit the consumer. They either will not or cannot see that the vast majority of people have to work in some way or other and are thus producers as well. Each one of them generally produces one class of articles and consumes a variety of others. If now the price has to be lowered on the article he produces, his buying capacity will be restricted—in many cases so much so that he cannot buy any commodities at all, no matter how much the prices may be lowered.

The only class of people who will not get hurt by such price reductions are the fortunate ones who live off the interest on their capital and thus do not produce. That class alone gets the full benefit of lower prices on commodities. It thus seems that the free traders are working for the interests of the rich who do not need to work.

The stagnation in business caused by the fear of unpractical and experimental legislation has cost and is at present costing the country enormous amounts, and it is marvelous that none of the agitators in Congress has any feeling in that respect. The only explanation I can see is that the agitators are personally interested in the prolongation of this uncertainty.

N. LILIENBERG.

PHILADELPHIA, SEPTEMBER 7, 1911.

What Is the Matter with Business?

An editorial answer to the above question was recently printed in the Sunday Call of Easton, Pa. The position taken by the editor of that paper is so refreshingly different from the attitude assumed by many of his newspaper colleagues that we feel sure that our readers will take pleasure in perusing his remarks as reproduced below:

There has grown up within the past decade a demand for an interference by the government with what is termed "big business." There are United States commissions, composed almost all of lawyers and "experts" just out of colleges, whose official duty is to tell those who have their money in an enterprise or in a big business how the same must be conducted or carried on. These learned commissioners—who pretend to be acting for the people—find it necessary, if they would hold their positions and draw their salaries, to keep themselves in the limelight. To do this they must, forsooth, keep nagging those who are doing the country's "big business" until the men who are in these "big business" enterprises have little time to attend to anything except court trials. There was a time when men who did a "big business" were considered invaluable and most desirable citizens. To-day they are not only being fined for crimes that are new in the calendar, but they are threatened with imprisonment.

Nor is the United States government alone in these prosecutions (or persecutions, have it either way), but nearly every State is making laws against the way that men have found it best to do their business, and there is another lot of commissioners drawing fine salaries for creating business disturbances.

What would you do if you kept a store and were trying to do business if an inspector came in every day to tell you what to buy and what you must pay for your goods and what to charge for what you sold? You'd be more than human if you did not tell your daily caller to get out p. d. q. or wish he were in a place that rhymes with "well." Now "big business" is not unlike "small business." There is no difference in doing business. It is all done with a view to profit or gain. Of course, sometimes—too often—it is with a loss, but that can't be helped.

The unthinking person may see a difference between the men doing a big business and those who do a smaller business. We don't. The old Knights of Labor motto was "The injury of one is the concern of all." And so it is with business. If the "big business" man is hurt—it doesn't matter in what way—it won't be long before the smaller fellow will feel it. And when there is any interference with the small dealer the first to find it out—and to his sorrow—is the bigger chap. And go along the line to the consumer—who buys of the small dealer, who buys of the big dealer. Curtail his working time or cut down his wages and you'll not need to wait long to hear some one crying "ouch" at the other end.

The people of the country are like the spokes of the wheel. Every spoke that is broken weakens the wheel. Interference with the manufacturer by any combination of men has an ill effect on the whole. Put the transportation companies to unexpected expense and they'll start out to economize—certain to start with the discharge of employees, the shortening of working days, or a failure to keep their road beds and locomotives and cars in the best condition. Thousands of railroad shop men are idle half the time. We know how it is in Easton. The companies can't spare the money to keep their workmen employed. They need the money to pay big fees to lawyers to defend them in court. No man can spend more than a hundred cents for a dollar, and no railroad company or industrial enterprise or "big business" undertaking can with the same money pay big fees for legal services and its men in its shops.

We read a great deal these days about the "conservation" of the coal fields and the forests and the water powers. But whoever thinks of the "conservation" of the business interests? The country has gone mad in its assaults on business enterprises, and now having done all that could be done to bring about the prevailing condition we wonder, in our stupidity, what's hurting us. The way the country has been led by demagogues into the financial bog verifies the statement made many years ago by an English writer that there was a larger proportion of fools in America than in any other land.

Trench & Co.'s Hopeful Forecast

The market report of C. S. Trench & Co., 81 Fulton street, New York, is always interesting, but the one issued September 5 is especially so. Following are some extracts from it:

"We see no reason, in spite of the heavy declines in Wall Street since our last report, to change our opinion regarding an improvement in business operations during the next few months. Such statistics as are available bear witness to an increase in the business operations of the country. We spoke in our last two reports of an improvement having commenced, and cited the iron, steel and metal trade as bearing witness to this fact. This week a statement has been issued by the United States Steel Corporation which must be rather surprising reading to those who, influenced by the decline in securities, may have formed the impression that the business of the country was very poor and going backward. [Extracts are then given from President Farrell's statement which was printed in *The Iron Age* of August 31.] That prices are slightly lower does not spell dullness and bad business. The iron and steel market is virtually an open market now; there are no pools, and therefore it is quite natural that in some cases prices are lower. With an unmanipulated market it is not unnatural that with increased demand, after a dull spell, the competition for the business should make in some cases lower prices. That the manufacturers of the country should feel more confident over the immediate future is easily explained from the fact that the tariff question, as far as any actual duty changes, has been put off for easily 18 months, if not two years. . . The trust question of course remains, but even on that subject we have a rest for at least three months. In other words, the developments in business have been favorable, even including the reaction in Wall Street. That reaction should have taken place two or three months ago. Perhaps it is just as well that it did not, otherwise it might have caused a mild panic, as business was then very much unsettled over tariff, trusts and crop failures. As it is now, the present decline in Wall Street prices has made no impression whatever in depressing commercial circles. This we think a very interesting feature and well worthy of being noted.

"There has, however, been one unfavorable feature interjected into the situation, and that is the labor question. It would have been extraordinary if our labor interests were not excited over the remarkable happenings of the past few weeks in England. How serious our labor question may become remains to be seen, but we are inclined to think the present fears are exaggerated, and that it will be felt more seriously next spring than this autumn. We think the outlook good for business in America over the next three months, but believe the English strike has perhaps ended the late wonderful European trade movement abroad of the past two years, and that nothing very encouraging may be expected from now on from that quarter. They have, however, had a good long innings. . . From our standpoint the September improvement is as much to be expected now as we thought a fortnight ago, because the intervening dullness was also expected."

The Pittsburgh Gage & Supply Company, Pittsburgh, states that orders during July and August were not good, but that a very satisfactory increase has been noticed this month, especially in the oil filter and oiling system departments. It has received another order from the Jones & Laughlin Steel Company for a large White Star oil filter to be installed in its Aliquippa Works. Orders for large duplex and multiplex White Star filters have also been placed by the William Tod Company, Youngstown, Ohio; Allis-Chalmers Company, Milwaukee, Wis.; Wisconsin Engine Company, Corliss, Wis.; Pocahontas Coal Company, Ware, W. Va.; Philadelphia Company, Sistersville, W. Va.; Standard Plate Glass Company, Butler, Pa., and Trinidad Electric Transmission, Railway & Gas Company, Trinidad, Colorado.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 13, 1911.	Sept. 6, 1911.	Aug. 9, 1911.	Sept. 14, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace.	13.50	13.50	13.50	13.75
Foundry No. 2 Southern, Cincinnati	*13.25*	13.50	13.50	14.25
Foundry No. 2, Birmingham, Ala.	*10.00*	10.25	10.25	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.50
Basic, delivered, eastern Pa.	14.75	14.75	14.50	15 00
Basic, Valley furnace	13.00	13.00	13.00	15.75
Bessemer, Pittsburgh	15 90	15.50	15.50	15.90
Gray forge, Pittsburgh	13.90	13.90	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.40	1.60
Furnace coke, future delivery	1.60	1.60	1.65	1.75
Foundry coke, prompt shipment.	1.85	1.85	1.85	2.10
Foundry coke, future delivery	2.10	2.10	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26 00	26 00	26.00	29.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27 00
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	**14.50**	14.00	14.00	16.00
Iron rails, Philadelphia	17.00	17.00	17.50	18 00
Car wheels, Chicago	*12.75*	13.00	12.75	14.00
Car wheels, Philadelphia	*12.75*	13 00	13.00	13.75
Heavy steel scrap, Pittsburgh	*12.75*	13.00	13.25	14.50
Heavy steel scrap, Chicago	10 50	10.50	10.75	12.25
Heavy steel scrap, Philadelphia.	*13.00*	13.25	13.50	13.75
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1 25	1.25	1.25
Refined iron bars, Philadelphia.	1.27½	1.27½	1.27½	1.40
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	**1.22½**	1.20	1.20	1.37½
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, tidewater, New York.	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	1.30	1.30	1.35	1.40
Tank plates, tidewater, New York	1.46	1.46	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.20	1.40
Skelp, sheared steel, Pittsburgh.	1.30	1.30	1.30	1.50
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*1.90*	1.95	2.00	2.15
Wire nails, Pittsburgh†	1.65	1.65	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	*1.95*	2.00	2.00	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12 75	12.75	12.87½
Electrolytic copper, New York	*12.37½*	12.50	12.62½	12.62½
Spelter, St. Louis	**5.90**	5.80	5.80	5.35
Spelter, New York	**6.05**	6.00	6.00	5.50
Lead, St. Louis	*4.40*	4.42½	4.45	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	*39.75*	41.25	43.00	34 80
Antimony, Hallett, New York	7.75	7.75	7.75	7.87½
Tin plate, 100-lb. box, New York	*$3.84*	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c. to 1.35c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net. Other shapes and sizes are quoted as follows:

I-beams over 15 in.	1.45 to 1.50
H-beams over 18 in.	1.50 to 1.55
Angles, 3 to 6 in., inclusive, ¼in. and up	1.35 to 1.40
Angles over 6 in.	1.45 to 1.50
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909.	1.40 to 1.45
Tees, 3 in. and up	1.40 to 1.45
Zees, 3 in. and up	1.35 to 1.40
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.	1.40 to 1.45
Deck beams and bulb angles	1.65 to 1.70
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.35 to 1.40
Nos. 9 and 10	1.40 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.55 to 1.60
Nos. 15 and 16	1.65 to 1.70

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.60 to 1.65	.....
Nos. 13 and 14	1.65 to 1.70	.....
Nos. 15 and 16	1.70 to 1.75	1.80 to 1.85
Nos. 17 to 21	1.75 to 1.80	1.85 to 1.90
Nos. 22, 23 and 24	1.80 to 1.85	1.90 to 1.95
Nos. 25 and 26	1.85 to 1.90	1.95 to 2.00
No. 27	1.90 to 1.95	2.00 to 2.05
No. 28	1.95 to 2.00	2.05 to 2.10
No. 29	2.00 to 2.05	2.10 to 2.15
No. 30	2.10 to 2.15	2.20 to 2.25

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.95 to 2.00
Nos. 12, 13 and 14	2.05 to 2.10
Nos. 15, 16 and 17	2.20 to 2.25
Nos. 18 to 22	2.35 to 2.40
Nos. 23 and 24	2.45 to 2.50
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.05 to 3.10
No. 30	3.25 to 3.30

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2 40	23	$2.40	$3.50
28	$1.40	2.25	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3 05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

THE IRON AND METAL MARKETS

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:
9 and coarser....80
10 to 18....80 and 10
19 to 26....80 and 10 and 2½
27 to 36....80 and 5
Galvanized:
9 and coarser....75 and 10
10 to 16....75 and 10
17 to 26....72½ and 10
27 to 36....72½
Coppered or Liquor Finished:
9 and coarser....75 and 10
10 to 26....75 and 10
27 to 36....70 and 10 and 5
Tinned:
6 to 18....75 and 10 and 10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
1 to 1½ in.	..	..	49	43
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Pittsburgh

PITTSBURGH, PA., September 13, 1911.

Actual business taken by the mills so far this month has been somewhat of a disappointment and if the present light rate of new orders continues through the rest of the month it will not show up as well as August. The fact is pretty generally recognized that the iron trade at present is going through a crucial period and the outcome depends much on the action taken by manufacturers to meet conditions as they develop. On practically everything but rails the market is as wide open as it was in February two years ago, but there has not been the scramble on the part of the mills to get orders at the sacrifice of prices that was seen in February, 1909. One reason for this is that prices to-day on all iron and steel commodities are low. The whole trade is moving along cautiously, placing orders for only such material as it needs, and prices, while holding fairly well, are somewhat weak. Pig iron is very dull and so is steel. Reports are that sheet bars have been offered at about $2 a ton below what is considered the regular price, and by a mill. There have been no marked changes in prices of finished iron and steel, but there is continued weakness in sheets, tin plates, wire products and pipe. The coke market is fairly strong, but prices on iron and steel scrap are weak and lower. General conditions are far from being satisfactory, but at the same time there is a moderate amount of new business being placed, which two or three years ago would have kept the mills going to practically full capacity. It is expected that conditions will improve within the next month or two, but the immediate outlook is not any too bright.

Pig Iron.—The United Steel Company at Canton, Ohio, has closed for the purchase of 3500 tons of basic iron, 500 tons for September and 1000 tons a month for October, November and December. The iron is understood to have been sold by the Canal Dover furnace, which has a rate of 50c. a ton from Canal Dover to Canton, Ohio. The price is understood to have been about $13 at furnace. Sales are also reported of about 750 tons of malleable iron at $13.25, Valley, and 300 to 500 tons of gray forge at $13, Valley. Some inquiry is out for small lots of foundry iron for delivery over the remainder of this year, on which furnaces are quoting $13.50 at furnace. We quote as follows: Bessemer, $15; basic, $13; No. 2 foundry, $13.50; malleable Bessemer, $13.25; gray forge, $13, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—There is little or no new inquiry for steel, but specifications against contracts for billets and sheet and tin bars are reported as coming in very nicely. More aggressiveness is being shown on the part of some steel mills to get orders and reports are that sheet bars have been offered as low as $20, delivered, which is a cut of $2 a ton from what are regarded as regular prices. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base; sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Ferromanganese.—An Ohio steel interest has closed for about 4000 tons of foreign 80 per cent. ferromanganese for delivery through all of 1912 at either $36.50 or $36.75, Baltimore. This is the largest inquiry that has come in the market for some time and it brought out some low prices. We also note sales of about 400 tons of foreign 80 per cent. for delivery through the first half of 1912 at $36.90, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton. It is evident that the efforts of importers to hold to $37 have not been successful. We quote foreign 80 per cent. at $36.50 for remainder of this year and $36.75 to $37 for first half of next year.

Ferrosilicon.—There has been a very sharp advance in prices of ferrosilicon, one local dealer reporting a small sale at $58, Pittsburgh. A local interest is in the market for 300 tons of 50 per cent. for delivery in 1912, but owing to the high prices asked the business has not been closed. We quote 50 per cent. at $57 to $58, and blast furnace as follows: 10 per cent., $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Ashland, Ky., and Jackson, Ohio, furnaces.

Muck Bar.—There have been no recent sales in this market and we quote best grades made from all pig iron at $28.50 to $29, Pittsburgh.

Skelp.—The market is very quiet and no new sales are reported. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—New demand for rods is dull and specifications against contracts are unsatisfactory. We continue to quote Bessemer, open hearth and chain rods at $27, Pittsburgh, but this price could no doubt be shaded if any attractive business was being offered.

Steel Rails.—The Carnegie Steel Company has sold 2100 tons of standard sections to the Pittsburgh & Lake Erie Railroad and has also taken some good sized orders for standard sections for export. This company received last week specifications and new orders for about 4000 tons of light rails. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

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Plates.—No new orders for steel cars are being placed, and the whole plate market is dull. The Northern Power Company, Akron, Ohio, is in the market for 700 tons of plates for a pipe line. None of the plate mills has any great amount of work ahead, and unless some orders for steel cars or other work come up soon they will have to run at a lower gait. We quote ¼-in. and heavier plates at 1.30c. to 1.35c., Pittsburgh.

Structural Material.—New inquiries are active and a good deal of work is being given out, but most of it is in the New York and Chicago districts. The McClintic-Marshall Construction Company has taken 3000 tons of steel for the spillway gates and valves for the Isthmian Canal and 1200 tons for paper mills for the Lake Superior Paper Company, Sault Ste. Marie, Ontario. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Sheets.—New demand and specifications against contracts are fairly heavy, the demand having been stimulated to some extent by the concessions in prices being made by makers, which have resulted in practically an open market on sheets. These concessions, as a rule, amount to $1 to $2 a ton, and the latter seems to be bottom of the market. So far as known none of the mills will shade prices more than $2 per ton, and this is done only on very attractive orders and to the large trade. The leading sheet mills are operating to about 70 per cent. of capacity. The full schedule of prices now in effect on the different grades of sheets is printed on a previous page.

Tin Plate.—The buying season in tin plate is over and very few new orders are being placed, but a number of the leading mills, including the American Sheet & Tin Plate Company, state that specifications against contracts are coming in very freely. The leading tin plate mills report that shipments of tin plate in August were the heaviest in any one month for some time, and in the case of two or three of the largest tin plate mills were the heaviest in any one month in their history. The American Sheet & Tin Plate Company has put on five hot tin mills at its Sharon, Pa., works, but has taken off others, so that its rate of operation is about the same as heretofore. The Jones & Laughlin Steel Company is ready to start up its second unit of 12 hot tin mills at its Aliquippa works, but these will not likely be started for some little time, owing to the light demand. On new orders for tin plate the leading mills are quoting $3.60 per base box, but shipments are still going forward on contracts, based on $3.70 per box of 100 lb. We quote cokes at $3.60 to $3.70 per base box, f.o.b. Pittsburgh

Spelter.—The spelter market has recovered considerable of its lost ground in the past week, prime Western grades being quoted to-day at 5.85c., East St. Louis, equal to 5.97½c., Pittsburgh. A sale of 100 tons for September and October shipment was made about the middle of last week at 5.80c., East St. Louis. Stocks in the consumers' hands are reported light and new demand is more active at present than for some time.

Shafting.—Several local makers report that some nice specifications from the implement makers have been received in the past week, and this trade is specifying more liberally than for some time. New orders being placed are fair, but mostly for small lots. Prices on shafting continue irregular, and while the official discount on carload and larger lots is 60 per cent. off list, actual prices on carload and larger orders range from 60 and 5 per cent. to 60 and 10 per cent. off list, the latter discount being named only to the very largest trade.

Railroad Spikes.—Some fairly liberal specifications have been received by local makers in the past week from the Baltimore & Ohio and the Pittsburgh & Lake Erie railroads. The regular price of railroad spikes is $1.50 per 100 lb., base sizes, f.o.b. Pittsburgh, but on some orders recently placed $1.45 has been done.

Merchant Pipe.—A local gas interest placed an order last week for about 5 miles of 6-in. iron line pipe and another local gas interest placed 6 miles of 12-in. steel pipe and is in the market for 10 to 12 miles more of the same size. New demand for merchant pipe is fairly active, actual orders and specifications received in August being reported heavier than in the previous month. All the leading pipe mills have guaranteed prices to jobbers against decline until October 1. It is stated that discounts on both iron and steel pipe are slightly shaded in some cases, but only to the large trade. Regular discounts on iron and steel pipe are printed on a previous page.

Boiler Tubes.—Several mills report that specifications on locomotive tubes have latterly been coming in a little more freely, but the new demand for merchant tubes is very dull and only for small lots to cover actual needs. Regular discounts continue to be more or less shaded.

Bars.—Both iron and steel bars are dull and owing to the falling off in placing contracts for steel cars there has been a noticeable decrease in orders for steel bars from the car building concerns. Some mills rolling iron bars are slightly firmer in their ideas as to prices and are not willing to make concessions any longer, such as have been prevalent for some time. The steel bar mills are reported to be operating to about 75 per cent. with the exception of one leading interest which is pretty well filled up and is reported to be running its mills to nearly full capacity. We continue to quote steel bars at 1.20c. to 1.25c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Steel.—New orders are still confined to small lots to cover actual needs, and specifications against contracts so far this month have not been as active as in August. Indications are that shipments by the mills this month will show a falling off as compared with last month. Regular quotations are as follows: Iron finished tire, ¼ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finished, 1.90c.

Hoops and Bands.—Several makers report that specifications in the past two weeks on hoops have been coming in more freely, but bands are rather quiet. We quote steel hoops at 1.40c. and bands at 1.20c. to 1.25c. extras on the latter as per the steel bar card.

Rivets.—A fair amount of new business is being placed, but mostly in small lots to cover actual needs of consumers. Orders for structural rivets are said to be more active than for boiler rivets. We quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but these prices are shaded on desirable orders.

Wire Products.—A fair amount of new tonnage in wire nails and wire is being placed. Stocks all over the country are reported as very light and a material improvement in demand is expected as soon as fall trade opens up. We quote galvanized barb wire at $1.95 to $2, painted $1.65 to $1.70, annealed fence wire $1.45 to $1.50, galvanized $1.75 to $1.80, wire nails $1.65 and cut nails $1.60, all f.o.b. Pittsburgh, full freight added to point of delivery.

Coke.—Most blast furnaces have covered their coke requirements for the remainder of the year and are out of the market. Two Valley blast furnaces have been buying their coke from month to month for some time, and one of these interests has recently bought 18,000 tons of standard grade blast furnace coke for September shipment at $1.50 to $1.55 per net ton at oven. We also note a sale of 60 cars of high grade furnace coke for September delivery at $1.60 per net ton at oven. Several coke makers report that specifications against contracts for foundry coke have been coming in quite freely. Prices on furnace coke seem to be a little firmer for the best grades. Output of coke in the Upper and Lower Connellsville regions last week was 347,284 tons, an increase over the previous week of about 15,000 tons. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and on contracts for remainder of this year at $1.65 to $1.70 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.85 and up to $2, and on contracts from $2.10 and as high as $2.40, the latter price being paid for some brands of coke that have a very high reputation in the trade.

Iron and Steel Scrap.—Only a small amount of scrap is moving from dealers to consumers and the market is weak. The embargo on scrap routed to the Pittsburgh Steel Company at Monessen, Pa., has been removed and shipments are now going forward to this company, which is the largest individual user of heavy steel scrap and other grades in the Pittsburgh district. The Pennsylvania Railroad list on scrap closed last week and bids made by dealers were somewhat lower than on the previous list, the heavy steel scrap being reported as having sold at $12.75, delivered. The Baltimore & Ohio list is closing this week, and it is understood bids

THE IRON AND METAL MARKETS

of dealers on this list were lower than on the August list. We note sales of 1800 to 2000 tons of heavy steel scrap at $13, delivered to consuming point in the Pittsburgh district; also 500 tons of turnings at about $9.25, delivered; also a sale of 200 tons of low phosphorus melting scrap at $15.50, delivered. Dealers are now quoting lower prices on heavy steel scrap, cast scrap, low phosphorus melting stock and borings and turnings. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery.	$12.75 to $13.00
No. 1 foundry cast	12.75 to 13.00
No. 2 foundry cast	12.25 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.00 to 11.25
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	15.50 to 15.75
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13.25
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.00
*Machine shop turnings	9.25
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, September 12, 1911.

What was true of this market a week ago continues to prevail at this writing. Specifications are being received at a rate that shows no great falling off, but new business is noticeably lacking. The mill tonnages are being maintained only with considerable effort. Rail sales are reported as insignificant and new competition in track fastenings in this market is not expected to add strength to the situation. Contracts for fabricated steel placed during the week were in scattered tonnages and aggregated about 2700 tons. With reference to sheets, plates and steel bars conditions are much alike and concessions are the rule. Bar iron tonnage is light, but manufacturers are making a strong effort to preserve prices on a basis affording some profit. There seems to be little doubt that in wire products the buyer has been satisfied with regard to prices in connection with the placing of fall contracts. The Southern pig iron makers are showing an increasing desire for business and quotations are being made more attractive. The local market for old materials is weaker and declines in prices are noted.

Pig Iron.—The past week developed a disposition on the part of some of the Southern furnaces to encourage by slight concessions an interest on the part of melters. Immediate shipment iron is obtainable on a $10, Birmingham, basis; for delivery during the remainder of the year at $10.25 and for delivery running over into the first quarter at $10.50. While no quotations are reported as having been made thus far on first quarter iron only, indications point to $10.50 as the price for this business. A number of sales in small tonnages are reported, but the business taken was of a scattering variety and insufficient to relieve the general quiet of the market. Local conditions remain unchanged and Chicago and Milwaukee furnaces continue to quote $14.50 at the furnace. The revision of the rate from Ohio to Mississippi River points, making it $3.75 instead of $3.10 as at present, is to become effective October 1. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky Silvery, 8 per cent	18.90
Jackson Co. and Kentucky Silvery, 10 per cent	19.90

Rails and Track Supplies.—It is suggested that should the threatened railroad strikes in the West materialize they would throw into the general market a considerable quantity of work which otherwise the shops of the railroad would handle. At the present time a general strike seems unlikely and the railroads show no disposition to increase the volume of their purchases. Rail sales during the week are reported as too unimportant to be recorded, although it is understood a small amount of export business was obtained. The market for track bolts and spikes shows moderate specifying. It is expected that the entrance of the new factor into the local market may bring out additional weakness in track fastenings. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Contracts covering fabricated steel reported during the past week included 663 tons for a conservatory and college building at St. Mary's, Ind., the general contract for which was let to the Bedford Stone & Construction Company; 406 tons for alterations in the Poole Building, let to A. Bolter's Sons, Chicago; 457 tons of structural steel for an Ohio River dam at Woodland, W. Va., awarded to the American Bridge Company; 630 tons for steel transmission towers for the Southern California Edison Company, Los Angeles, placed with the Riter-Conley Mfg. Company; 194 tons of bridge spans at Payette, Idaho, to the Minneapolis Steel & Machinery Company; 102 tons for the El Dorado County Court House, Placerville, Cal., to the Judson Mfg. Company, and 236 tons for Hegeler Bros. at Danville, Ill. The Lally Company, San Francisco, will build its warehouse building of reinforced concrete construction. Plain material continues to be the strongest of the finished lines and we quote for mill shipment, Chicago delivery, 1.53c. and from store 1.75c.

Plates.—The failure of Western steel car business to materialize in quantity has cut down the possible plate tonnage in this market to a marked extent and concessions have been offered quite generally. Prices on the basis of 1.30c., Pittsburgh, are reported. We continue to name full prices, which are for mill shipment, Chicago delivery, 1.53c., and from store, 1.75c.

Sheets.—The situation as regards sheets is not materially changed from the condition reported last week. Shading of prices is quite as common and the effort necessary to obtain sufficient orders to maintain the present rate of production quite as urgent. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—New business in steel bars is very slow and specifications show a slight decrease in volume. The base price of 1.25c. is distinctly above the market, which is quite generally $1 a ton less, with some quotations reported at even lower levels. Bar iron mills have met with considerable success in maintaining their demands for better prices, and while the asking price of 1.25c., Chicago, is not always obtained, sales at less than 1.22½c. are the exception. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.38c. to 1.43c.; bar iron, 1.22½c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—The fact that a considerable amount of contracting has taken place in wire products, while the leading interest reports a general satisfaction with prices, seems to indicate that purchasers are being taken care of in keeping with the general situation. Indications point to an average fall business with steady prices. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The letting of 7000 tons of pipe scheduled for last week at Muskegon, Mich., was delayed and it is now expected that the award will be made during the current week. The only other municipal contract awarded was at Belle Plain, Iowa,

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amounting to 400 tons. Miscellaneous business has held up well and the demand for 4-in. pipe in particular is crowding the plants. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—Prices for steel scrap are generally inclined to be soft as a result of an extremely indifferent buying sentiment. The larger melters, already in possession of large stocks, seem desirous of reducing their holdings rather than increasing them even at attractive prices. The long-continued period of low prices has taken the edge from the speculative possibilities offered by current quotations and opportunities once attractive now seem only to contribute to the general weakness. The Baltimore & Ohio Railroad is offering a list of about 8000 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.50 to 14.00
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Steel knuckles and couplers	10.25 to 10.75
Steel springs	10.25 to 10.75
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., September 12, 1911.

A firmer tone is observed in the pig iron market. The statistical position in this territory, as noted by returns to the Eastern Pennsylvania and Virginia Pig Iron Association, show the situation to be more favorable to producers than for any previous month this year. The volume of orders taken in August shows a material increase over the previous month, while stocks on furnace banks have again declined. As far as current buying of pig iron is concerned, there has been little change. The finished material situation continues quiet. Coke shows a firmer tendency. A further softness has developed in the old material market and prices for the leading grades have been forced to a lower level.

Iron Ore.—An air of expectancy regarding some large business in Swedish ore is still noted, but nothing definite has been reported. Importations for the week ended September 9 were confined to Cuban ore, of which 4550 tons was brought in.

Pig Iron.—A somewhat better feeling prevails. Consumers in many cases are urging deliveries on contracts and the current make in this district is believed to be slightly under the consumptive rate. Several producers are falling behind somewhat in deliveries, which reason is given for the blowing in of the Topton furnace of the Empire Steel & Iron Company in the immediate future. Occasional sales of larger lots of foundry iron are reported. One New Jersey sanitary ware manufacturer has closed for 2000 tons of mixed grades, and several 500-ton lots of No. 2 X and No. 2 plain have been taken by local and nearby melters. The larger proportion of the sales have, of course, been confined to small lots for early shipments. Standard brands of No. 2 X are comparatively firm at $15 to $15.25, delivered in this immediate vicinity, and in isolated cases even $15.50, delivered, has been done. While inquiries for foundry grades have not been quite so numerous as recently, it is evident that many consumers have not covered fully for their fourth quarter needs. They are buying in small lots from time to time, however, rather than contract for large quantities. Some little inquiry for first quarter of 1912 is noted, but sellers in this district still refuse to open order books for such delivery. Cast iron pipe makers are feeling the market for low grade iron, but no definite tonnage appears to be involved. The majority of Virginia producers maintain the price of $12.50, at furnace, for deliveries up to the end of the year, although one seller is reported to be willing to accept such business at $12.25. Little movement is reported in Southern iron. The steel making grades remain quiet. There has been no inquiry reported for basic, while small lot transactions in low phosphorus iron are made at unchanged prices. The recent inquiry for forge iron for rolling mill purposes has developed into business. One lot of between 3000 and 4000 tons, for delivery over the next three months, has been sold, the reported price being $14.50, delivered, while small sales at about the same price have also been made. The following range of prices is named for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—A tentative inquiry for 900 tons of ferromanganese is reported, but sales have been confined to a few small lots. Prices are gradually working higher, $37, Baltimore, being generally named for this year's delivery. Some sellers quote $37.50 for first half and $38 for the entire year of 1912, although reports are heard that $37, Baltimore, has been shaded for Western business for the latter delivery. No transactions in 50 per cent. ferrosilicon are reported, but prices have been advanced, ranging from $58 to $59, delivered. A small lot of furnace ferrosilicon has been sold at unchanged prices, $23 to $25 per ton at furnace, with specifications within Bessemer limits as to phosphorus and sulphur, plus $3.30 freight to points in this vicinity.

Billets.—Current sales are light. Few inquiries of any size come out, although one Eastern consumer is understood to be feeling the market for a round quantity, covering requirements extending over several years. Billet makers are not particularly encouraged with the situation, and prices covering any quantity of material are uncertain. For current business, however, open-hearth rolling billets are held at $23.40, and forging billets at $28.40, delivered in this vicinity.

Plates.—A pretty fair volume of miscellaneous small orders continues to be received by Eastern makers. Specifications are comparatively well maintained, but the aggregate is scarcely sufficient to enable mills to maintain their recent productive rate. Plates for structural work appear the most active, although marine boiler and ship plates have been in fair demand. Considerable business in ship plates is in sight, but develops slowly. For the ordinary run of business quotations are firmly maintained at 1.50c., delivered here.

Structural Material.—Business in this line has been quiet. A few small buildings have been contracted for and some small bridge work for local railroads is being figured on. Contracts for the local Municipal Convention Hall, for which the McCaull Construction Company was the low bidder, have not been awarded, and a feeling exists that the scheme will not be pushed as rapidly as expected. An architect has been selected for the new Stock Exchange Building, and plans for financing this project are now under way. Prices of fabricated material appear somewhat firmer, while for plain shapes 1.50c., delivered, is maintained.

Bars.—Reports are current that the recent quotation of 1.20c. at mill for refined iron bars is being shaded, but no definite information is available. The leading mills continue to name this price, equal to 1.27½c. to 1.32½c., delivered here, in carload lots. The demand, however, is extremely quiet and the market can hardly be said to have been seriously tested. Steel bars continue rather quiet, with quotations ranging from 1.35c. to 1.40c., delivered.

Sheets.—The demand shows no improvement. Current orders are small and principally for prompt shipment, and Eastern mills are operating on an unsatisfactory basis. Eastern makers, while not fully meeting concessions of Western mills, frequently make price adjustments under sharp competition.

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Coke.—The market has a slightly firmer appearance. Recent low prices for spot furnace coke are no longer available, the range now being from $1.55 to $1.65 at oven, with forward furnace coke quoted at $1.65 to $1.75. Moderate sales of foundry coke for shipments extending over the next three to six months are reported at practically unchanged prices—$2 to $2.25 at oven, according to grade. The following range of prices, per net ton, is named for deliveries in this territory:

Connellsville furnace coke	$3.80 to $4.00
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.40 to 3.60
Foundry coke	3.85 to 4.20

Old Material.—The volume of business moving is extremely small. Consumers are pretty well supplied and show no interest in the market. Sales when made are of the bargain character. There has been no movement in heavy melting steel, and offers for No. 1 railroad steel are lower. Bids against railroad lists are in, but no awards have yet been announced. There is practically an entire absence of speculative buying in any grade. The following range of prices, while largely nominal, about represents the basis at which business could be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.00 to $13.25
Yard heavy melting steel scrap	12.75 to 13.00
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles (nominal)	24.50 to 25.00
Old iron rails	17.00 to 17.50
Old car wheels (nominal)	12.75 to 13.25
No. 1 railroad wrought	15.00 to 15.50
Wrought iron pipe	12.00 to 12.50
No. 1 forge fire	10.75 to 11.25
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	8.25 to 8.75
Cast borings	7.75 to 8.25
Machinery cast	12.75 to 13.25
Railroad malleable (nominal)	11.00 to 11 50
Grate bars, railroad	9.75 to 10.25
Stove plate	9.75 to 10.25

Cincinnati

CINCINNATI, OHIO, September 12, 1911.—*(By Telegraph.)*

Pig Iron.—The largest inquiry before the trade is one from a Michigan melter for 2000 tons of malleable, shipments to commence next month. A southern Ohio firm is asking for 500 tons of charcoal iron for movement this year. Foundry iron inquiries are limited to a few very small lots to fill immediate requirements. Sales are correspondingly light and the total business closed last week would scarcely be considered a decent sized order during a normal period. Southern prices appear to be firm around a minimum figure of $10.25, Birmingham, for delivery through the remainder of this year, but it is probable that a bona fide offer would bring out concessions from several producers. Northern iron is unchanged at $13, Ironton, with a number of furnaces asking $13.50, and one sale of 250 tons of No. 2 foundry was made on a basis of $13.25 for last quarter delivery. Malleable is quoted at $13.25 at furnace and a few medium-sized lots have changed hands in the past few days. Consumers are practically taking no interest in any delivery beyond December, apparently believing that present low prices will prevail for first quarter business. No additional dormant furnaces in the Ironton district are preparing to blow in, and nothing but a healthy, firm advance in prices would induce their owners to consider resuming operations. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13 00
Ohio Silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—The foundries have generally contracted for enough coke to run them through the remainder of the year, and quite a number have enough bought to cover their requirements until July, 1912. There are no indications of any awakening in the furnace trade, and it is almost a certainty that the coke business will be extremely dull until at least January 1. For domestic use small lots are being sold, but even this particular demand is not up to normal. Prices are unchanged, with 48-hr. coke obtainable in the Connellsville field around $1.50 to $1.65 per net ton at oven, with a premium of about 10c. to 20c. asked for Wise County and Pocahontas standard grades. The regular quotations on foundry coke range from $2 to $2.30 at oven, but it is quite possible that the lower figure could be shaded on prompt shipment business.

Finished Material.—Steel bars show considerable improvement, and in this territory no lower price than 1.20c., Pittsburgh, is being done, with local warehouse prices ranging from 1.65c. to 1.70c. Structural material is moving fairly well and is quotable around 1.75c. to 1.80c. in local warehouses.

Old Material.—There has been no change for the better, and, with the possible exception of No. 1 cast scrap, all grades are in very poor demand. While dealers are hopeful for better conditions, there is nothing in the present situation to warrant any immediate change. The approximate prices paid by buyers delivered in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.25 to $10.75
Casting borings, net ton	4 50 to 5.00
Steel turnings, net ton	5.50 to 6 00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting sheet scrap, gross ton	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, September 12, 1911.

Iron Ore.—Sellers regard the prospects for a fair volume of business during the early part of next year as much more favorable than they were for sales in the corresponding period of this year. The heavy buying in the early part of last year, which was followed later by a falling off in the demand for iron and steel and the heavy reduction in the expected consumption of ore, resulted in the carrying over of large stocks of ore. Because of having overbought, some furnace interests have this year purchased no ore or a very limited tonnage. Ore men believe that surplus stocks will be light by the opening of navigation next year, and that the demand will then be considerably better than it was early this season, even if conditions in the iron and steel trade show no further improvement by that time. The only sale reported for the week is a small lot of non-Bessemer ore. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The United States Steel Company, Canton, Ohio, has purchased 3500 tons of basic iron from a nearby furnace having a freight rate of 50c. The price is said to have been above $13.50, delivered. Another furnace that recently made sales at $12.65, Valley furnace, and having a 90c. freight rate, is understood to have bid $13, at furnace. The foundry iron market in this territory is exceedingly dull. Sales are confined to a few small lots. Two local inquiries for 1000 tons each, noted last week, failed to result in much business. One for the first half was withdrawn, the consumer declining to pay 50c. a ton advance over current prices that was asked by the furnaces. The foundry that had an inquiry out for 1000 tons for the last quarter decided to defer buying any large tonnage and placed an order for only a very limited amount. Foundries that are not covered by contracts are generally buying small lots as needed. One merchant furnace in the Valley, the stock pile of which is becoming quite low, may be blown in before the end of the month. There is no change in prices. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13 00 to 13.25
Southern foundry No. 2	14.60 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.55

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Coke.—The market is dull. There is no demand for furnace grades. There is one inquiry for foundry coke for a year's requirements. The only sales reported are in small lots. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for spot shipment, and $1.60 to $1.65 for contract. Connellsville 72-hr. foundry coke is held at $1.85 to $1.95 for prompt shipment and $2 to $2.40 for contract.

Finished Iron and Steel.—Mills are getting a fair volume of business, the improvement noted during August being maintained. Orders are quite plentiful but they are nearly all for small tonnages. The structural market continues the most active. Local fabricators are figuring on more small work than for some time. The contract for the steel for the new city hall building, Cleveland, 3800 tons, has been awarded to the Republic Structural Iron Works, Cleveland, the low bid of that company amounting to about $38.50 per ton, delivered. About 700 additional tons will be required later. For the work let Bethlehem sections are specified for about 65 per cent. of the tonnage. The remainder has been divided between other mills. Bids are being received for 400 tons of steel for the Cleveland Press Building. Considerable tonnage will be required for a new building to be erected by the News-Bee, Toledo, Ohio, for which plans are expected out shortly. The outlook in the lake shipbuilding industry shows some improvement. The Great Lakes Engineering Works, Detroit, has closed a contract for a package freight steamer for the Eastern trade and the Standard Oil Company has received bids for a steamer for the oil trade. Other boats are being figured on to go to the coast for special trades. There is practically no change in the price situation. Steel bars are firm at 1.20c., Pittsburgh. Tank plates are well established at 1.30c., but this price is not so general on boiler steel. Structural material is firm at 1.35c., Pittsburgh. Sheets are generally quoted at 1.90c., Pittsburgh, for No. 28 black, 2.90c. for No. 28 galvanized and 1.45c. to 1.50c. for No. 10 blue annealed. The demand is rather light. There is a fair demand for billets in carload lots. The demand for iron bars has improved slightly, but prices are weaker, being shaded to meet the competition of Western mills. We quote iron bars at 1.20c. to 1.25c., Cleveland.

Old Material.—The market is very dull and prices are weak, although most quotations are unchanged. Mills are not taking scrap freely and are buying very little. One local steel plant is out of the market and another is buying only such material as is offered at very attractive prices. Yard dealers are awaiting a firmer market and are declining to offer stocks at current prices. Turnings are particularly weak, there being no demand for this grade. The Pennsylvania Railroad received bids September 12 on a large tonnage. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.50 to $12.75
Old iron rails	14.50 to 15.00
Steel car axles	17.50 to 18.00
Heavy melting steel	11.50 to 11.75
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.00 to 12.50
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.75 to $19.25
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.25
Steel axle turnings	8.00 to 8.50
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.75 to 12.00
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, MO., September 11, 1911.

The iron, steel and coke markets here all seem to show the same characteristics—a hand to mouth business with an aggregate which is quite satisfactory, all things considered, as compared with any part of the present year at least. No large new business is reported in any direction, but all the orders, whether on specifications or in new business, are for immediate delivery, showing that the materials are wanted for current use. There is no future buying.

Pig Iron.—The sales of the week, in new business, include a number of single carload lots, and one or two orders for 100 tons each. Inquiries are received for 350 tons and 100 tons which will be closed in a few days. A good taking on contracts is reported. The price remains steady on the basis of $10.50 to $11, Birmingham, for No. 2 Southern, and $13 to $13.50, Ironton, for No. 2 Northern. Basic, malleable, etc., are absolutely lifeless.

Coke.—A contract for 5000 tons of Stonega best 72-hr. selected coke, at the market, for delivery over the next six months, was the only evidence of activity in this market developed during the week. Takings on contracts continue up to the mark, and there are no reports of consequence of consumers falling behind in their requisitions. All orders are for the quickest possible shipment, indicating that everybody is pretty well up with supplies and buying for current needs in small lots while awaiting the developments of the fall season.

Finished Iron and Steel.—The aggregate of business continues to show gains, but it is still being made up of small orders for immediate shipment. In fact, that seems to be about the only point on which there is competition, the prices being held undisturbed by buyers' attempts to gain concessions. In standard rails the only sale of the week was of 500 tons for an Arkansas road, which was in addition to a previous contract. Track fastenings have been in good demand and prices remain firm. In structural steel the orders of the week were for specific business only, and immediate shipment was the consideration in practically every instance. A very good quantity was taken in comparison with previous weeks. In bars there was liberal specification against contracts, with immediate delivery conditions, showing that the consumers were in need of the material for use at once. Fabricators are showing no very strong desire to order for stock, but are good purchasers nevertheless. In light rails there has been practically no demand from the coal trade, but there has been a little sign of life among the lumber roads. In plates there has been practically nothing doing. The award for the material for the Ft. Worth dam, which was expected the past week, has been held up for a short time, but is expected to come through during the month.

Old Material.—While there has been no specific softening of prices in the scrap market, there has been nothing doing. No lists have come out and the dealers are engaged chiefly in trying to round up lots at low prices to ship on orders taken after the recent flurry in figures approached its climax. Consumers seem to have taken up to their requirements for some little time to come and are keeping out of the market, apparently in the hope of a reduction of prices, which, however, are very well held. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

Birmingham

BIRMINGHAM, ALA., September 11, 1911.

Pig Iron.—A sale of 2000 tons of gray forge iron is reported at $9.25, Birmingham, for delivery through the remainder of the year. Otherwise transactions in the majority of cases have involved carloads and lots of 100 to 200 tons each for comparatively early delivery. At this time there are no good reasons to expect a heavier buying movement during the coming week. The inquiries pending are very much on the same order as those received for some weeks past, with the lack of interest on the part of buyers for first quarter and first half deliveries probably more pronounced. For

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such deliveries the producing interests are apparently content to await further developments before fixing prices, and accordingly are not solicitous for orders. It is believed in certain quarters that $10.50 per ton, Birmingham, can now be made applicable to first quarter shipments strictly, but producers' records do not show any such transactions. As a matter of fact, the tonnage so far sold for first quarter delivery is very small comparatively, and even in one or more cases a significant portion of the output through the last quarter is yet to be disposed of. The most interesting development in the local situation is the statement that stocks were further reduced in August. Figures just compiled show that the aggregate on Alabama furnace yards September 1 was approximately 240,000 tons, representing a reduction of 26,000 tons in August. Of the total, approximately 60,000 tons is covered by warrants and 16,000 tons is free basic iron, leaving some 160,000 tons of free foundry iron, with the output represented by 13 active stacks. We quote as follows per gross ton, f.o.b. cars here for shipments to Southern points during the remainder of the year:

No. 1 soft	$11.00
No. 1 foundry	11.00
No. 2 soft	10.50
No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25

Cast Iron Pipe.—A lot of 4000 tons of water pipe for Charlotte, N. C., has just been bought, and a material addition has been made to the order placed some weeks ago from Portland, Ore. The movement of the past week from local plants was very heavy, particular mention being made of the forwarding in one shipment of 1100 tons to San Diego, Cal., by the United States Cast Iron Pipe & Foundry Company. The percentage of active capacity has not yet increased, but repairs to the plant formerly operated by the Dimmick Pipe Company are well under way. Aside from several small lots for requirement in the Middle West and the usual offerings for maintenance work no new business is now being advertised, but prices are being fully maintained and we continue to quote the market at the following prices per net ton, f.o.b. cars here: 4-in. to 6-in., $23; 8-in. to 12in., $22; over 12-in., average $21, with $1 per ton extra for gas pipe.

Old Material.—Dealers have added materially to their stocks in the past fortnight and report a fair volume of new business pending. The actual consumption has improved slightly, and it is understood that the mills now in operation will continue to receive shipments at a fairly steady rate for some months. We continue to quote the market nominally at the figures below per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Waddill Catchings, New York, is now in the Birmingham district looking over the properties of the Central Foundry Company and the Central Iron & Coal Company, of which companies he is president.

Ward W. Jacobs, Hartford, Conn., president of the Shelby Iron Company, has been inspecting the properties of his company in the Birmingham district.

Hammond-Byrd Iron Company has been incorporated to succeed the Hammond-Byrd Company. H. Hammond is president; William H. Byrd, Jr., vice-president, and H. L. Morrow, secretary and treasurer.

The German Iron Market

Luxemburg-Lorraine Furnaces Stay Out of the Pig Iron Syndicate

BERLIN, August 31, 1911.

The long-drawn-out negotiations between the Pig Iron Syndicate and the independent producers in the Luxemburg-Lorraine district came to an end at last yesterday and with a negative result. The outlook for an understanding had been declared to be so bright within the past week or two that the meeting yesterday had been looked forward to as merely a formal procedure for giving validity to an arrangement already practically agreed upon. It turned out otherwise, however, and the rupture between the two interests is pronounced to be final. The split came over the question of allotments for the outsiders. The Syndicate interests proposed to take the actual shipments of the various furnaces during the year 1910 and the first half of 1911 as the basis for the new allotments; but the Luxemburg-Lorraine furnace owners objected to this as unfair to them, inasmuch as the furnaces in the Rhenish-Westphalian district, which are the leading interests in the Syndicate, made unusually heavy shipments in 1910, including considerable export business, whereas they themselves, they said, were holding back with their shipments. They therefore came forward with a counter proposition to take the shipments of the first half of 1911 as the basis for allotments. This would have amounted to giving the Luxemburg-Lorraine group about 53 per cent. of the allotments; but the Syndicate was not willing to concede more than 50 per cent. The previous price arrangement with these outsiders was not renewed yesterday, but an attempt to do this was made today; a positive result, however, was hardly looked for. Failing this, the Luxemburgers will be free to begin taking contracts tomorrow at their own terms.

Steel Trade Satisfactory

The Steel Works Union held its regular monthly meeting yesterday and gave out its usual report on the business situation in semi-finished material, structural shapes and rails. It says that the home trade in steel material for further manufacture continues satisfactory. Consumers are well employed and are calling for shipments on order at a satisfactory rate. Business for the fourth quarter of the year was declared open at unchanged prices. The recently announced improvement in the foreign market has been maintained, and prices have further risen. Sales continue good, notwithstanding the interference caused by the great strikes in England. In heavy rails foreign business remains good, and some further large orders have been taken. The Württemberg state railroads have given their contracts for rails, the amounts called for being somewhat greater than for the current year. Calls for grooved rails and light ones for mines are satisfactory, but a quieter tone in new business is noted. Home business in structural forms remains good. Books were declared open for the fourth quarter at unchanged terms. Foreign business in this line is good with most countries, and specifications are coming in briskly, except from England during the strikes. The prospects for a good autumn trade are regarded good.

The bar manufacturers held a meeting today at Düsseldorf to take preparatory steps for another effort to get together. A commission to take the matter in hand was appointed, and another meeting will be held about October 1. The aim appears to be merely to reach an agreement as to bottom prices. It is seriously doubted, however, whether anything will come of this movement.

As for the rest, there seems to have been hardly any change in the market situation since a week ago. Trade continues fairly satisfactory. Nevertheless, the stock market has been excited for a week over the Morocco affair, as well as over its own excesses in speculative buying of iron shares during the past few months; and these had a sharp backset last week. They lost more heavily in August than for many months. The latest news from Belgium indicates that the recent improvement in the trade there has been maintained, but no further advances in prices are reported.

Boston

BOSTON, MASS., September 12, 1911.

Old Material.—The scrap market continues dull. While prices have not declined, neither have they stiffened in any particular. Material continues to come out in large quantities, but from the dealers rather than from the producers. Export business with Canada, confined as always to No. 1 wrought and soft steel, remains active, conditions there being apparently better than in this country. In other classes of scrap Canada is doing a considerable export business, chiefly with Europe. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In compari-

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son with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices. The quotations follow:

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.20 to 14.70
Old iron axles	17.70 to 18.70
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.75 to 8.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

Buffalo

BUFFALO, N. Y., September 12, 1911.

Pig Iron.—While the volume of inquiry for the past week has not been so large as in either of the two weeks preceding, it represents a fair total, including about 4000 tons of foundry grades for early delivery and 1500 tons for deliveries beyond the last quarter of the year. Sales for the week have aggregated about 10,000 tons, principally foundry grades. Furnaces are well filled with shipping specifications on contracts, and there remain only small gaps to sell them to capacity for the remainder of the year. A careful canvass of the situation shows that there will be very small stocks, if any, on furnace banks in this vicinity on January 1, the policy of the furnacemen evidently being shaped to that end. The Wickwire Steel Company has one furnace out for relining, which will bake until October. Prices show a stiffening tendency and furnacemen are absolutely firm at the minimum shown below. Not much inclination is as yet indicated on the part of producers to negotiate for 1912 deliveries. We quote as follows, f.o.b. Buffalo, for fourth quarter delivery:

No. 1 X foundry	$14.00 to $14.25
No. 2 X foundry	13.75 to 14.00
No. 2 plain	13.75 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Old Material.—The market is stagnant in every line, as far as new business is concerned. Consumers' wants are apparently well covered for present needs, causing a very restricted demand. Prices have sagged slightly in some grades and producers are holding fast to their stocks on account of the low prices. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13 00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Finished Iron and Steel.—The demand continues fairly active for most lines of finished products, with structural steel leading in demand and in stability in prices. Inquiries and orders are being received in about the same volume as for the past month. One noticeable improvement is that mills which have for some time been able to make shipments on bars within three or four days are now compelled to extend deliveries in many instances to three or four weeks. There is no cessation in the activity which has prevailed in fabricated structural lines during the latter part of the summer, and local contractors are experiencing some trouble in placing orders for prompt delivery. The Charles F. Ernst Sons Iron Works has received contract for the International Railway Company's substation on Fillmore avenue, 250 tons, and the George Kellogg Structural Company, for the Magnus Beck hotel and café, 100 tons. The 400 tons of standard shapes for the Main Street Realty Company's store and office building will be furnished by the Lackawanna Steel Company and fabricated by the Charles F. Ernst Sons Iron Works, the remaining 200 tons for this building to be Bethlehem shapes. The steel for the Buffalo General Electric Company's 17-story office building, 1200 tons, for which the Riverside Bridge Company, Martin's Ferry, Ohio, holds contract for fabricating, is being rolled by the Carnegie Steel Company.

New York

NEW YORK, September 13, 1911.

Pig Iron.—An encouraging amount of inquiry from New England, New Jersey and New York State has come to the producers of foundry and basic iron in the past week. One inquiry is for 5000 tons, another for 3000 tons; others for 2000 tons, 1500 tons and 1000 tons, there being several for the last-named tonnage. Several of these buyers will probably close this week, the deliveries called for in all cases being for the last quarter of the year. A Brooklyn foundry has bought upward of 1000 tons in the week, and a stove foundry in New Jersey is asking for 1500 tons. There are no new developments as to prices, except that Buffalo furnaces are now more generally quoting $13.75 for No. 2 X for delivery late in the year, though the $13.50 iron has not disappeared. A slight reduction in stocks at the furnaces represented in the Eastern Pig Iron Association is reported for August, these stocks being now around 100,000 tons. Foundries as a rule are taking in all the iron coming to them under their contracts. In some cases considerable stocks have been carried by melters and it is possible that consumption is more than is indicated by blast-furnace operations. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—The structural trade in this and nearby districts has been giving a good account of itself in the past week, a number of awards being reported on work that has been pending for some time. The two largest contracts taken are the Boston & Albany bridge at Worcester, Mass., 4000 tons, by the Pennsylvania Steel Company, and the Aeolian building, New York, 3500 tons, by the American Bridge Company. The New York Central has let a total of 2000 tons of steel work—800 tons and 500 tons on two sections of the terminal work in this city, 200 tons for a bridge at Watertown, N. Y., and 500 tons for signal bridges. Other railroad awards include 200 tons for the Green street station of the Boston Elevated, taken by L. F. Shoemaker & Co.; three bridges for the Boston & Maine, 280 tons, taken by the Boston Bridge Works; three bridges for the Central New England Railroad, 180 tons; signal bridge for the B. & O., 100 tons. In New York recent lettings include a hospital building at Forty-second street and First avenue, 1200 tons, taken by the Hinkle Iron Works; Pavilions L and M for Bellevue Hospital, 1200 tons; the Meyrowitz building on Fifth avenue, 300 tons, by A. E. Norton & Co., and a stable for the Empire State Dairy Company, Brooklyn, 500 tons, by Levering & Garrigues. The last-named company was also awarded an addition to the Edison Company power house at South Boston, 250 tons, and the First National Bank at New Haven, Conn., 400 tons. The Ward-Corby Company bakery building at Cambridge, Mass., 900 tons, went to the McClintic-Marshall Construction Company; the high school at Schenectady, N. Y., 400 tons, to the Jones & Laughlin Steel Company; the Philadelphia Rubber Works warehouse at Philadelphia, 300 tons, to the Belmont Iron Works; a building at Lancaster, Pa., 500 tons, to the Phoenix Bridge Works; the Masonic Homes hall at Elizabethtown, Pa., to the same company. Bids go in October 10 on the postoffice at Washington, D. C., 4000 tons, and the Filene building, Boston, 5000 tons, will be bid on again next week. The steel for the Albany Capitol Building, 300 to 400 tons, will be furnished by the American Bridge Company. The plate trade shows little change from recent conditions, the volume of business from week to week being about the same, but the movement is irregular; few transactions call for large quantities, the demand in this locality being mainly for repair work. Some of the plate mills report an exceptionally good business in flanging work, keeping that department of their works in excellent shape. Steel bars are quiet, the demand calling for small lots only. The Eastern bar iron trade has become restricted to a limited number of mills, which

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are reported as actively engaged. Most of these mills make finished products into which bar iron enters and thus they work up a considerable part of their bar output. The leading makers, however, report a sufficient volume of business in bar iron, in addition to their own consumptive requirements, to keep their mills fairly busy. It is interesting to note that most of the business of these mills is now coming from railroads. Quotations are continued as follows: Plain structural materials and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—Although specifications have not yet been issued, it is understood that the Department of Water Supply, Gas and Electricity of the city of New York will open bids September 26 from contractors, for laying over 8000 tons of 48-in. and perhaps some other sizes of pipe. This department opens bids to-day for furnishing and laying 560 tons of 12-in. pipe and fittings. A few public lettings are coming out in New England, but they are for unimportant quantities. The situation has again changed, as many of the inquiries recently in the market have failed to result in sales, and the aspect of affairs is therefore less encouraging. This change in the attitude of buyers may perhaps be due to the recurrence of liquidation in Wall street. Carload lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—The market is exceedingly quiet. Consumers of steel scrap are making offers which are considerably under the views of holders, and business in this line is therefore practically at a standstill. The rolling mills are purchasing sparingly and are pursuing the same policy as the steel companies in offering low prices. The foundries are not taking much cast scrap, apparently having sufficient stocks on hand to supply their limited requirements, the foundry jobbing trade being decidedly slack. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.00 to 12.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	10.00 to 10.50
Old car wheels	10.50 to 11.00
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.50 to 11.00

Ferroalloys.—Several sales of 200-ton lots of ferromanganese have been made at around $37, Baltimore, for delivery this year. Dealers here are quoting $37.25 for delivery over the first half of next year. Ferrosilicon is advancing and sellers of the European product are out of the market as they are demanding more than $60. Several New York sellers refused a consumer's offer to buy at $57, and they are quoting from $58 to $59 over the first half of next year.

Metal Market

NEW YORK, September 13, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Sept.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
7	12 75	12 50	43 00	4.50	4.42½	6.00	5.85
8	12.75	12.50	42.55	4.50	4.42½	6.05	5.87½
9	12.75	12.37½	....	4.50	4.40	6.05	5.90
11	12.75	12.37½	40.75	4.50	4.40	6.05	5.90
12	12.75	12 37½	40 25	4.50	4.40	6.05	5.90
13	12.75	12.37½	39.75	4.50	4.40	6.05	5.90

Arrivals of pig iron so far this month have been very heavy, but most of the stocks have been taken up and prices are not much lower. Quotations on electrolytic copper have been reduced. Lead is easier in St. Louis. Spelter is more scarce.

Copper.—Some good business has been done in electrolytic copper as the result of a reduction made last Saturday when quotations were lowered ⅛c. Buyers who came into the market yesterday and to-day found that there was not much for sale at that price for early September and October delivery, and a few of the large sellers raised their quotations to 12.50c., which was the market before the reduction. Other people were offering electrolytic copper, however, at 12.37½c., but if there is any great amount of buying the market will soon return to 12.50c. There is scarcely any demand for Lake copper and the price is largely nominal at 12.75c. L. Vogelstein & Co. give the following figures of German consumption of foreign copper for the months January-July, 1911: Imports, 106,077 tons; exports, 4928 tons; consumption, 101,149 tons, as compared with consumption during the same period in 1910 of 95,092 tons. Of the above quantity 91,771 tons was imported from the United States. In London this morning spot copper was sold for £55 8s. 9d. and futures for £56 2s. 6d.

Pig Tin.—So far this month 3130 tons of pig tin has arrived in this country. Considering the fact that 3000 tons is considered a normal month's arrival, these heavy shipments are almost unprecedented. Nevertheless, spot tin is not over plentiful as most of this material has been shipped into the interior. The market is somewhat shaky because of unsettled conditions abroad and quotations have not been reduced as much as might be expected. There is only a fair amount of tin on hand for September and some for October delivery. A considerable quantity of pig tin that came in during the week was owned by the leading consumer. The price this morning was 39.75c. for September delivery. In London this morning spot tin was sold for £180 5s. and futures for £178 10s.

Tin Plates.—The mills are doing a good business and some fair sized sales were made during the week to a big packing company that manufactures its own tin boxes. A reduction of 10c. has been made in some quarters on 100-lb. coke plates. The price now is $3.84 to $3.94. The foreign market has been unusually steady for several weeks and the price remains unchanged at 13s. 9d. at Swansea, Wales.

Lead.—Lead is weaker in the West and outside dealers who have been in control of the market there have reduced their quotations to 4.40c. They continue to quote higher than the American Smelting & Refining Company in this market and the New York price is unchanged at 4.50c., which is the quotation made by the leading interest.

Spelter.—Stocks of spot spelter are very short in New York and they have been greatly curtailed in St. Louis. A good amount of steady buying has been done during the week but it has been hard to define just what prices were paid as dealers were continually changing front and each day saw fluctuations. This morning the price in New York was 6.05c. and in St. Louis 5.95c.

Antimony.—Antimony is plentiful and so little is being taken that prices are uncertain, as some dealers are very anxious to sell and there are reports of cutting. Hallett's is fairly firm at 7.75c., but Cookson's might now be had as low as 8.25c. Chinese and Hungarian brands are quoted at 7.20c.

Old Metals.—Although profound dullness prevails, dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy cut and crucible	$12.00 to $12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11 00
Brass, heavy	8.00 to 8 25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

SEPTEMBER 11.—Metal sales the past week were at about an average rate for this market. Although a slight weakness was observed in prices values were without material change. We quote at Chicago: Casting copper 12.65c.; Lake, 12⅞c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42½c.; small lots, 44½c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6.00c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 4¼c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

SEPTEMBER 11.—The metal market for the week has been rather quiet. Tin is quoted here at 42.87½c.; Lake copper is a little off at 12.97½c. and electrolytic likewise at 12.80c.; antimony, unchanged at 8.72½c., and lead a little better at 4.37½c. to 4.40c. Spelter has shown more firmness, being quotable at 5.85c., with a fairly good demand. In the Joplin district quotations are well held in all the ores. The mines are producing a little more than they have been and the surplus has increased slightly. The prices for old metals are as follows: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, September 13, 1911.

The stock market has experienced another period of liquidation. Quite a number of stocks made new low records for the year. The lowest prices were made on Thursday, Friday and Saturday. On Monday some improvement occurred, but even then the stock market did not exhibit decided strength. The most disturbing influence of the past week was the fear of war between France and Germany over Morocco, which almost caused a panic in Berlin, during which American securities dealt in on the international exchanges suffered quite severely, our own market sympathizing considerably. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	6¾	Pressed Steel, pref.	98
Beth. Steel, com.	28 - 30⅜	Railway Spring, com.	30
Beth. Steel, pref.	60¼	Railway Spring, pref.	100
Can, com.	9½ - 10¾	Republic, com.	24 - 26⅜
Can, pref.	84 - 86⅝	Republic, pref.	89⅛ - 92
Car & Fdry., com.	47 - 49⅞	Sloss, com.	37 - 39½
Steel Foundries	27¾ - 30½	Pipe, com.	13 - 13¼
Colorado Fuel	28 - 28¾	Pipe, pref.	45 - 46
General Electric	150 - 153	U. S. Steel, com.	66⅞ - 72
Gr. N. Ore Cert.	45½ - 49	U. S. Steel, pref.	114⅛ - 116¼
Int. Harv., com.	103⅛ - 108⅝	Westg. Elec.	63 - 66½
Int. Harv., pref.	118 - 120	Va. I. C. & C.	75
Int. Pump, com.	31 - 33½	Am. Ship, com.	55 - 57
Locomotive, com.	34 - 36	Am. Ship, pref.	106½
Locomotive, pref.	105¾ - 105⅞	Chic. Pneu. Tool	46 - 46¾
Nat. En. & St., com.	16 - 17	Cambria Steel	43 ½ - 44⅜
Nat. En. & St., pref.	95 - 96	Lake Sup. Corp.	22 - 24
Pittsburgh Steel, pref.	101	Crucible Steel, com.	11 - 11½
Pressed Steel, com.	29½ - 31	Crucible Steel, pref.	80 - 80¾

Directors of the Plymouth Cordage Company, Boston, Mass., have voted to recommend to the stockholders that the stock be increased by 5000 shares, to be offered at par, $100, to stock of record October 2. The new financing is to capitalize expenditures in increasing the plant. The directors also voted to omit the usual extra cash dividend of $3 this year. The present stock outstanding is $2,500,000, receiving 8 per cent. regular dividends.

Dividends Declared

The American Pipe & Construction Company, Philadelphia, regular quarterly, 2 per cent., payable October 1.

The American Smelting & Refining Company, regular quarterly, 1 per cent. on the common stock, payable October 16, and 1¾ per cent. on the preferred, payable October 2.

The Cambria Iron Company, regular semi-annual of 2 per cent., payable October 2. This company leases its property to the Cambria Steel Company.

The Crucible Steel Company of America, quarterly, 1¾ per cent. on the preferred, payable September 30.

The Youngstown Sheet & Tube Company, quarterly, 2 per cent.

The Sloss-Sheffield Steel & Iron Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 1.

The Gorham Engineering Company has just completed a modern engine building works and boat shop at East Oakland, Cal. This establishment builds the entire craft, including engines, hull and all fittings. It also builds a full line of stationary, hoisting and marine engines from 5 to 250 hp, together with the Gorham air compressor and Gorham motor-driven fire apparatus.

The Oven Equipment & Mfg. Company has removed its offices and works from Stamford, Conn., to its new factory at Dixwell and Putnam avenues, New Haven, Conn. The increased demand for sectional ovens, inclosed flame gas burners and economizer gas appliances made the move neecssary.

Patriarche & Bell, steel merchants, 215 Pearl street, New York, have issued a new steel stock list which they are sending to the trade. This publication gives the sizes of high-grade steel which they regularly carry in stock for immediate shipment. They state that their stock of fine spring steel is probably the best assorted and largest of any in this country and that it is all of the best quality made. Of the steels thus held ready for immediate shipment they aim to have a very wide range of sizes and good quantities of each size. They have enlarged their stock of mining drill and quarry steels on account of the increase in their customers for such steels and the uncommonly good and uniform quality of the stock handled. The firm states that recent business has been good in the number of orders received, but disappointing as to their size.

The Goulds Mfg. Company, Seneca Falls, N. Y., has opened a new branch house at Ohio and Franklin streets, Chicago, Ill., to handle its business in the Middle West, including the States of Indiana, Illinois, Michigan, Wisconsin, Minnesota and Iowa. This house will take over the entire business of the present Gould Company with the exception of its line of centrifugal pumps. It will exploit the new line of volute centrifugal pumps which are made at the Seneca Falls factory along with the rest of the company's complete line, which includes hand lift pumps, force pumps, windmill pumps of all types, hand and power spray pumps, triplex power pumps, rotary pumps, centrifugal pumps, air compressors, vacuum pumps, working heads, etc., comprising in fact all types of pumping equipment for every service.

Isolated plant interests—consulting engineer, manufacturers, supply houses and business establishments interested in the progress of isolated plants who formed the National Isolated Power Plant Association, are issuing booklets aiming to give facts about isolated plants. It appears to be the feeling that a great many isolated plants fail to materialize owing to a misunderstanding of the relative cost of central station service and of service obtained from the building's own equipment. Copies of these booklets, which discuss the various features of cost of operation, depreciation and the like, may undoubtedly be obtained by writing to the secretary of the Association, F. C. Farnsworth, Bush Terminal, Brooklyn, N. Y.

The new No. 9 continuous bar mill of the Lackawanna Steel Company, Buffalo, N. Y., has been placed in operation. The company now has two bar mills, its No. 9 and No. 6, in addition to its No. 2 mill, which is used mostly for rolling angle bars. The No. 9 mill will have an estimated capacity of 100,000 tons per year. It will roll rounds from ¼ to 5 in.; coiled rounds ¼ to ¾ in.; nut flats for bolt and nut makers; squares, ¼ to 3 in.; flats, ⅝ x ⅛ to 6 x 2 in.; hexagons, ovals, half ovals, half rounds, small angles, etc.

The Fanner Mfg. Company, Cleveland, Ohio, has been making extensive improvements in its plant. It has just doubled the capacity of its malleable casting department by rebuilding the No. 2 furnace and installing modern molding machines as well as other improved equipment. J. L. Hopper has succeeded Mr. Swallow as superintendent of the malleable foundry. The company manufactures chaplets, stove trimmings, malleable and gray iron castings, brass beds and general stampings.

The Rosedale Foundry & Machine Company, North Side, Pittsburgh, has received a contract for iron and steel fittings for the Government dry dock at Puget Sound, which calls for about 150 tons. This company also manufactures the Playford mechanical stoker, for which it has received a contract for sixteen from a large steel manufacturr in Pittsburgh, while an Ohio user has placed a second order for four additional stokers.

The Knox Pressed & Welded Steel Company invites those interested to attend the formal opening of its plant at Niles, Ohio, Thursday, September 21. Different designs of water-cooled devices for open-hearth furnaces will be exhibited.

Personal

L. S. Schmidt, formerly chief engineer of the Alan Wood Iron & Steel Company, and for the past two years with the Upson Nut Company, has made a new connection, having accepted the vice-presidency of the Knox Pressed & Welded Steel Company. He will look after the open-hearth department and will give his personal attention to the manufacturing and installation of the Knox welded steel water-cooled ports, doors and door frames. He will make his headquarters at the works at Niles, Ohio.

Benjamin T. Delafield, who formerly represented the Lunkenheimer Company for a number of years in St. Louis and Kansas City territory, has become connected with the Best Mfg. Company, Pittsburgh, Pa., to handle its line of valves, fittings, flanges, pipe bends, fabricated pipe and other power plant material in the same territory. He will make his headquarters in Kansas City.

C. W. Tallcott, secretary and treasurer of the Ernst Wiener Company, 50 Church street, New York, manufacturer of contractors' and industrial railway equipment, returned last week from Europe, after a six weeks' absence.

Alfred E. Croft, sales manager in the Chicago district for the Colles feed-waterheater, has been appointed agent in the same territory for John Brennan & Co., Detroit, Mich., manufacturers of marine and fire-box boilers, tanks, etc.; also for the Brown Engine Company, Fitchburg, Mass., and the Franklin Oil Filter Company, St. Louis. His office is at 117 North Canal street, Chicago.

Ernst Mueller, manager of the American office of the German machinery selling firm of Schuchardt & Schutte, 90 West street, New York, is in Europe on a business trip.

At a meeting of the board of directors of Manning, Maxwell & Moore, Inc., September 11, George D. Branston was elected secretary and treasurer to succeed Jocelyn H. Evans, who resigned because of ill health. Mr. Branston was formerly connected with Joseph T. Ryerson & Son, Chicago, Ill.

Chairman E. H. Gary of the United States Steel Corporation, who has been abroad for nearly three months, sailed from Liverpool on the Lusitania on Monday.

Charles M. Schwab sailed for Europe September 9 on the Olympic for an absence of two months, his trip having to do in part with the ore arrangements of the Bethlehem Steel Company with Swedish producers.

Cecil A. Grenfell, who has represented English interests in the negotiations of the past few months for the merger of the Southern Iron & Steel Company and the Alabama Consolidated Coal & Iron Company, returns to New York this week from a trip to England.

Henry R. Cornelius, for many years sales manager of the Southwark Foundry & Machine Company, Philadelphia, and who has been district manager of the Wisconsin Engine Company at Pittsburgh since its incorporation, has severed the latter connection to enter a more diversified field in the sales department of the Mesta Machine Company, Pittsburgh, builder of heavy rolling mill machinery and power equipment.

Frank M. Eaton, resident partner of Hickman, Williams & Co., Cincinnati, Ohio, has returned from a summer vacation spent at his country home in Colorado.

Labor Notes

The Inside Ironworkers' Union, which called a strike in New York against two of the firms in the Employers' Association of Architectural Iron Workers, met with retaliation on the part of the employers who discharged 20 per cent. of the union men in the shops not affected and informed them that they could get jobs in the shops where the strikes had been called. This upset the union's plan to call strikes on a few shops at a time and no further action will be taken by the employees until a mass meeting can be held to discuss the subject.

The executive board of the International Association of Machinists, in session at Chicago September 10, refused to sanction the strike of the machinists in the Illinois Central Railroad shops.

Obituary

C. O. Brunner

Christian Otto Brunner, Bethlehem, Pa., died September 7, aged 80 years. He was born in the house in which he died. Educated in local schools, he spent some years in the mercantile business in Bethlehem, Philadelphia, Luzerne County and again in Bethlehem. On July 12, 1860, he was engaged by the then infant Bethlehem Iron Company as its first employee, taking charge of the hands, keeping time, making payments and acting as bookkeeper. Soon after he was appointed acting treasurer, and so remained until July, 1870, when he was elected treasurer of the company. In this position he remained, being continued in it by the Bethlehem Steel Company, until September 1, 1911, when, after a service of 41 years, he tendered his resignation. In connection with this long term of office he had the gratification, July 12, 1900, of being the guest of honor at a reception tendered him by the officers of the company in commemoration of his 40 years' service. Amid much reminiscent speechmaking he was presented with a silver service and a cane by the office force and as a mark of their personal esteem. He was actively engaged in relief work during the Civil War. Throughout his life he was associated with the work of the Moravian Church, taking an active part in various church organizations. He was a member also of the Pennsylvania, the Moravian and the Northampton County historical societies. His wife, to whom he was married in 1859, died in 1895. He leaves a son and a daughter. His son is Franklin H. Brunner, secretary of the Guerber Engineering Company.

EDWARD G. T. COLLES, president of the E. G. T. Colles Mfg. Company, Chicago, died in that city September 8 after a long illness, aged 52 years. He had been a resident of Chicago for 33 years, and was prominent in engineering circles, being known as an authority on water heaters, purifiers and separators, in connection with which apparatus he was the inventor of many devices.

EDWIN F. SIMONDS, vice-president of the Simonds Mfg. Company, died September 10 at Fitchburg, Mass., aged 62 years. Although latterly a resident of Pasadena, Cal., he had lived for 20 years in Chicago. He was born at Fitchburg and removed to Chicago to operate the steel plant of his company.

EDWARD W. HARDEN, director and general superintendent of the American Frog & Switch Company, Hamilton, Ohio, died at his home in that city September 6, aged 46 years. He leaves a widow and one daughter.

SHERMAN W. LADD, long prominently identified with the United Shoe Machinery Company, Beverly, Mass., died September 7. For a number of years he represented the company abroad, and for the past year had been superintending the construction and equipment of the new Canadian plant at Montreal. He was active in the organization of the company and was one of the oldest officials in point of service. He leaves a widow.

OLIN A. STRANAHAN, a well-known mechanical engineer, died September 8 in a dentist's office in New York while undergoing an operation for an abscess at the root of a tooth. For a long time Mr. Stranahan was in the service of Westinghouse, Church, Kerr & Co., and he spent spent five years with the British Westinghouse Company. For a while he was general sales agent of the Allis-Chalmers Company. He was a member of the Engineers' Club and of the American Society of Mechanical Engineers. He was born in 1866, and leaves a widow and a daughter.

FRANCIS L. ROBBINS, formerly president of the Pittsburgh Coal Company, and one of the largest operators in steam and coking coal properties in the United States, died at Mercy Hospital, Chicago, September 8, from an operation, aged 56 years. He was a director in several banks in Pittsburgh.

George T. Johnson & Co., iron and steel merchants, Philadelphia, Pa., formerly located in the Pennsylvania Building, announce their removal to 505 Chestnut street. The offices of the Johnson Engineering Company, associated with the firm, have also been moved to the new address.

The Steel Corporation's Unfilled Orders

The United States Steel Corporation reports that the unfilled tonnage on its books August 31 was 3,695,985 tons, or an increase of 111,900 tons over the amount reported July 31. For four consecutive months increases have been reported. Unfilled orders at the end of a given month are arrived at by deducting shipments in that month from the sum of the unfilled tonnage at the end of the previous month and the contracts and current orders entered in the month ("current orders" being new business coming in from day to day not applying against contracts). Specifications on contracts are, of course, not considered, as they would be a duplication of contracts previously entered. The table below gives the unfilled tonnage of the Steel Corporation by months since June 30, 1910, together with the amount at the close of each quarter from December 31, 1902, to June 30, 1910.

Aug. 31, 1911	3,695,985	Mar. 31, 1908	3,765,343
July 31, 1911	3,584,085	Dec. 31, 1907	4,624,552
June 30, 1911	3,361,058	Sept. 30, 1907	6,425,008
May 31, 1911	3,113,187	June 30, 1907	7,603,878
April 30, 1911	3,218,704	Mar. 31, 1907	8,043,858
Mar. 31, 1911	3,447,301	Dec. 31, 1906	8,489,719
Feb. 28, 1911	3,400,543	Sept. 30, 1906	7,936,884
Jan. 31, 1911	3,110,919	June 30, 1906	6,809,850
Dec. 31, 1910	2,674,757	Mar. 31, 1906	7,018,712
Nov. 30, 1910	2,760,413	Dec. 31, 1905	7,605,086
Oct. 31, 1910	2,871,949	Sept. 30, 1905	5,865,377
Sept. 30, 1910	3,158,106	June 30, 1905	4,829,655
Aug. 31, 1910	3,537,128	Mar. 31, 1905	5,579,560
July 31, 1910	3,970,931	Dec. 31, 1904	4,696,203
June 30, 1910	4,257,794	Sept. 30, 1904	3,027,436
Mar. 31, 1910	5,402,514	June 30, 1904	3,192,277
Dec. 31, 1909	5,927,031	Mar. 31, 1904	4,136,961
Sept. 30, 1909	4,796,833	Dec. 31, 1903	3,215,123
June 30, 1909	4,057,939	Sept. 30, 1903	3,278,742
Mar. 31, 1909	3,542,595	June 30, 1903	4,666,578
Dec. 31, 1908	3,603,527	Mar. 31, 1903	5,410,719
Sept. 30, 1908	3,421,977	Dec. 31, 1902	5,347,523
June 30, 1908	3,313,876		

A Steel Company Charges Discrimination.—Press dispatches report a suit brought against the Philadelphia & Reading Railway Company by the Alan Wood Iron & Steel Company, of Ivy Rock, Pa., in which the plaintiff seeks to recover $87,886 for damages, and asks that the defendant corporation pay a penalty of treble that amount for alleged illegal discrimination. It is charged that since April, 1905, the railroad company has refused to furnish motive power for the transfer of cars to and from the works in Ivy Rock, the company handling at its own expense 43,943 cars at an average cost of $2 per car. The complaint further says that the railroad company does the switching at Pencoyd Iron Works and the Phoenix Works at Phoenixville as well as at the Lukens and Worth plants at Coatesville, Pa.

Further Decrease in Idle Cars.—The number of idle freight cars in the United States and Canada was reduced by 19,629 in the two weeks ending August 30, as shown by the report of the American Railway Association, the net surplus on that date being 84,541 as compared with 104,170 on August 16. At the end of August last year the total number of idle cars was about 60,000 and the decrease in the two weeks preceding had been 31 per cent. More cars are in service now than twelve months ago, but the decrease of 19 per cent. in the last two weeks of August shows that the demand for cars in that fortnight did not grow this year in the same ratio as in the corresponding period of 1910.

Horace J. Stevens, Houghton, Mich., announces that the tenth annual edition of his Copper Handbook will be published September 15. Eighteen months have been spent in an absolutely complete revision of the mine descriptions and statistical section of the book. The new edition, Vol. X, will contain 1902 octavo pages of text, and will list and describe 8130 mining companies, mines and attempts at mines, this being much the largest number of titles given in any work of reference on mines. As in preceding years there will be several hundred pages of preliminary chapters devoted to the history, technology and uses of copper.

A new record for the loading of an ore boat was made at the Great Northern dock at Superior September 8, when the steamer W. E. Corey, of the Pittsburgh Steamship Company, took on 9325 tons of ore in 25 minutes, or at the rate of 373 tons a minute.

Lake Superior Iron Ore Shipments in August

Shipments of iron ore from upper lake docks in August were 5,548,311 gross tons as compared with 5,221,373 tons in the preceding month and 6,964,381 tons in August, 1910. Only about 16,000 tons was shipped last month from the new Cuyuna range, its total to September 1 being 111,265 tons. The shipments by ports in August, 1910 and 1911, and the totals to September 1 in the two years are as follows:

	Aug., 1911.	Aug., 1910.	To Sept. 1, 1911.	To Sept. 1, 1910.
Escanaba	706,445	697,412	2,418,251	3,162,271
Marquette	357,571	525,898	1,200,748	2,249,774
Ashland	407,578	645,107	1,509,841	2,878,971
Superior	1,689,952	1,332,284	6,382,273	5,227,687
Duluth	1,211,667	2,382,156	4,370,117	9,823,644
Two Harbors	1,175,098	1,381,524	3,724,838	5,484,682
	5,548,311	6,964,381	19,606,068	28,827,029

The shipments to September 1 this year were thus 9,220,961 tons, or 31.99 per cent. less than to the same date last year. Superior leads all ports this year, and has sent out 32.5 per cent. of all the ore shipped. To September 1 it had shipped 1,154,586 tons more than to September 1, 1910, whereas all the other ports show a marked falling off. Duluth's falling off was not only actual but relative. From having 34.08 per cent. of the total to September 1 last year it had only 22.29 per cent. this year.

American Rolling Mill Company Sheet and Pair Furnaces.—The sheet and pair furnaces at the plant of the American Rolling Mill Company, Middletown, Ohio (described in an illustrated article in *The Iron Age* of August 31), as well as the annealing furnaces and the furnaces for the jobbing mill are designed so that uniformity of heat throughout the hearth area is given, a soaking, slow, penetrating heat being secured by making the furnaces extra large. All are equipped with American underfeed stokers. Two of the larger sheet mills are provided with double continuous pair heating furnaces for special high-grade sheets. All the sheet furnaces, as well as the annealing furnaces, are of the double type. The slab heating furnaces in the sheet heating department are of the reversing type. Georg J. Hagan of Pittsburgh, furnace engineer and contractor, erected all of the above furnaces.

Illinois Steel Screw Spikes.—The Illinois Steel Company, Chicago, Ill., which has for a long time been manufacturing railroad spikes, has found it necessary, on account of the rapidly increasing demand for screw spikes, to equip its Joliet Works with screw-spike machinery. It is now prepared to furnish screw spikes of superior finish in either Bessemer or open-hearth steel. The company has just issued a most artistic booklet, which gives much detailed information with regard to spikes of this design. In it will be found the standard specifications for screw spikes adopted January 1, 1911, and sectional views showing dimensions, sizes of threads, etc. The company states that it is in position to manufacture many special sizes and shapes not shown in the publication.

At a meeting of directors of the Youngstown Sheet & Tube Company held last week former officers of the company were re-elected as follows: John A. Campbell, president; H. G. Dalton, of Cleveland, and O. S. Robinson, of Youngstown, vice-presidents; R. S. Garrick, treasurer; George E. Day, secretary, and W. B. Jones, auditor. The directors approved the revised plans for the building of six 60-ton open-hearth furnaces and a blooming mill. The plans for new finishing mills have not yet been fully decided upon.

The Reading Iron Company, Reading, Pa., in carrying out its plans for the modernization of all its plants, has awarded to the Pennsylvania Steel Company the contract for the structural steel for the renewal of its No. 5 pipe mill, on South Seventh street. The new brick and steel structure will be a great improvement in every way over the old frame building which for many years inclosed this mill, and the reconstructed building will fully harmonize in style and equipment with the adjoining and recently completed No. 6 pipe mill at the corner of Seventh and Laurel streets. It is expected that the foundations will be in shape before cold weather sets in.

The Milwaukee Industrial Exposition

In connection with its fiftieth anniversary, the Merchants' and Manufacturers' Association of Milwaukee, Wis., conducted during the ten days from September 2 to 12 an exposition of Milwaukee manufactured products. While not completely representative of the iron and steel industry that has grown so rapidly in that city, the exhibits presented a number of interesting displays.

The Pawling & Harnischfeger Company, crane builder, obtained a large measure of attention for its new single line grab bucket designed for the handling of sand in the foundry. A steel framework was erected in the booth with a runway for carrying a standard trolley. From this a 1½-yard bucket was hung, and its operation was demonstrated as under actual working conditions. A description of this device was published in a recent issue of *The Iron Age*. This exhibit also included I-beam trolley hoists up to 1½-ton capacity.

The Falk Company had in operation a new type 10-hp. kerosene engine, which it has designed and built under the Secor-Higgins patents controlled by the M. Rumely Company, LaPorte, Ind. At present this engine is being developed in 5, 10 and 15-hp. sizes, but larger models are to be brought out as soon as possible. The engine was directly connected to a generator under an intermittent lamp load. Under an instantaneous no-load to full-load jump, the engine regulation showed a variation of only three volts—an imperceptible drop, so far as affecting operating conditions. The unit was being run continuously during the exposition, and its apparent freedom from the ordinary oil engine troubles attracted very favorable interest. This company also had in operation a set of double helical gears which it manufactures under the Wuest patents. Gears of this style are made in sizes up to 12 ft. in diameter and 42-in. face from one-piece steel castings, the teeth being cut on a hobbing machine in one setting.

The Allis-Chalmers Company presented several types of portable electrically driven air compressors and air-brake systems and also a motor-driven 500,000-gal. centrifugal pump. A somewhat similar exhibit was displayed by the National Brake & Electric Company, a pioneer in the development of portable high pressure rotary air compressors for both industrial and railroad service.

Kearney & Trecker, whose milling machines have become established among the standard machine tools with a growth that in many respects is almost unique, exhibited in operation a vertical spindle miller on which a job of continuous milling was being machined. The pieces were connecting rod journal caps requiring the machining of six faces, and the total average time for finishing each was about two minutes.

The American Oxhydric Company conducted demonstrations, at hourly intervals, of both the welding and cutting of metals with the oxy-hydrogen flame. Description of what can be accomplished with these cutting and welding torches has appeared previously. In the present instance, apart from the popular interest excited by the spectacular character of the operations, significance attached particularly to the advantages of this method of cutting where the work is of irregular character or difficult of access with ordinary mechanical cutting tools. On such work as would require either involved machine work or slow hand clapping or cutting the oxhydric process operates at full speed and maximum efficiency.

The Pressed Steel Tank Company showed a number of pressed-steel regulation size barrels and the Vilter Mfg. Company had a refrigerating plant in operation.

The remarkable growth of Milwaukee and its present position as a manufacturing center are scarcely realized generally. Its manufacturing industries number 4126, and the value of its output of iron and steel machinery products in 1910 was $34,112,555.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its first meeting following the summer recess at the Manufacturers' Club, on the evening of September 6. President Thomas Devlin occupied the chair. The meeting was well attended by local and out of the city foundrymen. Following the usual reports of the secretary and treasurer, the name of J. Jacob Shannon & Co., 1744 Market street, Philadelphia, representing the Whiting Foundry Equipment Company, Harvey, Ill., was presented for membership and favorably acted upon.

The appointment of two delegates to represent the association at the convention of the Atlantic Deeper Waterways Association, Richmond, Va., October 17 to 20th, was considered. President Thomas Devlin was named as one and the other will be appointed later.

W. A. Pollock Davis, Philadelphia, read a paper on "The Use of Titanium in Iron and Steel Practice." After speaking briefly of the production of titanium, he described the beneficial results obtained in the addition of the titanium to molten iron and steel, resulting in the elimination of blow holes and other imperfactions. While excellent results have been obtained by such additions in the ladle, he advocated more particularly that they be made directly in the cupola, open-hearth or electric furnace, which would preclude the effect of irregular atmospheric conditions that are frequently met with while treating the metal in the ladle. The longer treatment in the original receptacle, he believed, was decidedly more efficacious than the short treatment necessarily following the method of ladle treatment.

Charles V. Slocum, general sales agent of the Titanium Alloy Mfg. Company, Pittsburgh, followed with an interesting address on the development and manufacture of titanium alloy. He referred to the supply of titanium ores and the early difficulties in manufacturing an alloy suitable for the purpose intended. The early alloys were a combination of titanium and aluminum, the manufacture of which was discontinued and the present commercial allow of titanium and carbon substituted. This material, when added in proper proportions to either iron and steel in the ladle, preferably placed in the warm ladle and the metal tapped or poured into it and stirred with a rod, in order to bring about an intimate mixture, makes the slag more fusible and eliminates the blow holes in the metal by permitting the occluded gas in the metal to escape, increases the temperature of the metal and minimizes shrinkage. In making additions of the alloy directly to the cupola more care is necessary. If the cupola is regularly slagged, not so much trouble is experienced, but as the alloy has a strong affinity for slag its fusion with that material is more likely when the slag remains in the cupola. Excellent results have, however, been obtained by direct additions, if necessary precautions are taken.

In general foundry practice 0.1 to 0.3 per cent of the alloy is used in the ladle, dependent on the grade of iron, representing a cost of 25 to 75 cents per ton of iron, the quantity increasing with the silicon content in the iron. In steel practice from 0.3 per cent upward is used, according to the softness or hardness of the metal. The use of the alloy prevents brittleness, and the carbon content of the steel may be materially increased, while at the same time the ducility and tensile strength of the metal are greater. This has been demonstrated in manufacture as well as in actual service, notably in steel rails. In isolated cases unsatisfactory reports on the benefits obtained from titanium alloy were reported, but these have been due apparently to defects in manufacture and in the use of the alloy in treating the metal. When used in the ladle in iron foundry practice, a small percentage of the alloy will overcome any variation in atmospheric conditions.

Following Mr. Slocum's address a brief discussion followed in which results obtained by various users of the alloy were cited and authorities named who strongly recommended its use in both iron and steel foundry practice. A vote of thanks was extended both Mr. Davis and Mr. Slocum. Adjournment was followed by a luncheon in the club dining room.

Chairman DuPuy of the Crucible Steel Company of America, Pittsburgh, states that the company's fiscal year ended with August 31, 1911, and the chartered accountants, Price, Waterhouse & Co., are now auditing the accounts for that period. No quarterly statement will therefore be issued at this time, as the annual report will be published later in the present month showing the full year's results. He added that it was only necessary to say that the earnings for the fiscal year have been very satisfactory and will probably show in the neighborhood of 10 per cent. on the company's preferred shares, after deducting $500,000 for depreciation of plants, etc.

The Progress of Metallurgy

Address by Sir Robert A. Hadfield at Sheffield, England, July 1, 1911

Below we reproduce the address delivered by Sir Robert A. Hadfield on the occasion of the conferment upon him of the honorary degree of doctor of metallurgy by the University of Sheffield. In presenting Sir Robert for this honor Professor Appleton, the public orator of the university, made the following complimentary personal allusion:

"The Hadfield family has long been associated with the history of this city, and the name of Robert Hadfield, Sr., takes rank with those of Huntsman and Bessemer, of John Brown and J. D. Ellis, of the Firths and the Jessups, as that of one of the original founders of Sheffield's steel industry. That tradition has been most worthily upheld in this generation by Sir Robert A. Hadfield, the distinguished son of a distinguished father. His discovery of manganese steel not only revolutionized the whole trend of metallurgical thought, but proved to be of extraordinary and world-wide utility. By the extent and variety of his research work in other directions he has added enormously to the scientific knowledge of iron and steel and their alloys, and his contributions to the proceedings of various learned societies have conspicuously enriched the literature of ferrous metallurgy.

"As an investigator his work has received universal recognition. The Iron and Steel Institute has awarded him the Bessemer gold medal, its most coveted honor; from the Institution of Civil Engineers he has received the Howard, the George Stevenson and the Telford medals and premiums; and numerous societies on the Continent and in America have delighted to do him honor. As the crowning point in his career he was installed, at the age of forty-five, president of the Iron and Steel Institute, and for two years he occupied that proud and enviable position as head of the most powerful and the most famous association of steel masters in the world. In Sheffield he is known not only as the head of a most successful business, not only as a scientist of the highest distinction, but also as an employer who has interested himself profoundly in everything that tended to improve the conditions of labor, and as one who has shown in many practical ways his genuine sympathy with those who work for and under him."

In accepting the degree Sir Robert said:

Sir Robert's Address

Among the many recognitions it has been my good fortune to receive, none will be more highly prized than this honorable distinction. It has been said that a prophet has no honor in his own country, but in conferring this degree upon me Sheffield has proved otherwise, and I am indeed most grateful. To receive from my fellow-citizens the very kind approval of such work as I have been able to do in the past on behalf of metallurgy is a distinction to be proud of, and one which falls to the lot of few.

SHEFFIELD'S FAME FOR HIGH QUALITY

Sheffield's fame in the manufacture of steel of the highest quality has spread throughout the world, and I can conscientiously say that whenever opportunity has presented I have never forgotten its interests, and these, in a well-traveled life, have not been few.

My interesting trip round the world has taught me more than ever that honest, sterling work and high quality tell, and everywhere I have visited I found the name of my city stand very high in this respect. It was the high quality and nature of our handicraft which we know appealed so much to Ruskin, and was the reason we secured his wonderful treasures. Let us ever continue our policy, aided, too, as we are now, by our alma mater, the university, to guide us and perfect us in our work. Lord Allerton, in a recent admirable speech to the Iron and Steel Institute, spoke of quantity not being everything, and that the first British interest was quality, on which our commerce has been reared. We in Sheffield do not want to follow the lead of some other countries where quantity may be the first desire, and quality left as a secondary consideration.

FAMOUS NAMES IN SHEFFIELD'S HISTORY

It is not necessary for me to now go, except very briefly, into Sheffield's past history. I remember getting together some information on this point when presenting my address as Master Cutler in 1899. In the past such names as Huntsman in the eighteenth century, Sanderson, Jessop, Brown, Mappin, Stephenson, Earnshaw, Vickers, Howell, Firth, Doncaster, Seebohm, Rodgers, Ellis Sorby and many others, both on the scientific and practical side, are household words, not only among us, but they are known in all lands, one may truly say to the uttermost parts of the earth.

Four names—Mark Firth, Sir Frederick Mappin, Sir Henry Stephenson and Dr. Clifton Sorby—specially stand out on the educational side of Sheffield's modern history; their untiring devotion can never be forgotten. I well remember our small beginning on the applied science side, and the opening address of Sir Frederick Bramwell when Professor Greenwood was in charge.

Coming down to present times, the same devotion to the department of applied science has been shown by our chancellor, the Duke of Norfolk, Dr. Hicks, our present Lord Mayor, Sir Joseph Jonas, Colonel Hughes, Sir William Clegg, Alderman Franklin, Sir Charles Eliot, Earnshaw Howell, Wilson Mappin, the present Master Cutler, the late T. Andrews, of Wortley, Drs. Arnold and Ripper, Aldermen Stuart Uttlay and Wardley and many others, ably aided as they have been by our indefatigable registrar and secretary, Mr. Gibbons and Mr. Swift.

It was largely due to a relative of mine, Sir John Brown, that the Bessemer process took such strong root in Sheffield, assisted as he was by his partner, J. D. Ellis, and the original work of the late William Allen, of H. Bessemer & Co. Some of you may not know that America was largely indebted to Sheffield in aiding its remarkable development in the seventies of last century, the great American metallurgist, Holley, receiving his training in the Bessemer process here in Sheffield. Moreover, the science of metallography, now such an important adjunct in metallurgical research, was founded in 1888 by a Sheffield man, the revered Dr. Clifton Sorby. It will be seen, therefore, that Sheffield has played an important part in the development of the metallurgy on iron and steel.

THE FUSION PROCESS OF MAKING CAST STEEL

While speaking of Sheffield and its past work, I may mention one interesting circumstance attending my travels round the world, and relating to the fusion process of producing cast steel, in which we in Sheffield are so much interested. We have all believed that Huntsman could justify claim to be the first to reduce this process to practical application, and in one sense he certainly did this; yet I find that it is more than probable that out in the East they knew more about methods of producing cast steel quite 2000 years ago, and probably even much earlier than we have in the past given them credit for. Aristotle, too, has spoken of the Hindus knowing how to manufacture steel about 300 B. C. I recently sent Dr. Arnold a set of photographs representing iron and probably steel tools which I came across during my visit to Ceylon, representing a most valuable collection arranged there by Dr. Willey, F. R. S. These are of undoubted antiquity, dating back 1500 to 2000 years.

By the kindness of my friend, the Governor-General of Ceylon, Sir Henry MacCallum, I have been allowed to have from the Colombo Museum a number of these priceless specimens, which we are now examining in our research department, and, as I have told Dr. Arnold, I shall be glad to afterward present them to the University Museum. Coming to modern times, and as an antithesis of this in point of date, it may be interesting to state, with regard to the present development of metallurgy in the Far East, that the steamer in which I crossed the Pacific last year

brought the first load of Chinese pig iron to the western shores of America. In view of the vast mineral wealth of China, what extraordinary possibilities this one fact opens out for the world's future in the metallurgy of iron and steel!

The particular branch of metallurgy, alloys of iron and steel, having been one which I have studied closely, it may be interesting to say a few words upon the topic; also to mention one of the reasons why I took this up. When visiting the Paris Exhibition in 1878, I was particularly struck with the wonderful exhibits of the Terre Noire Works, and young as I was at that time I determined to look into the subjects they were investigating, and the results of which they so freely placed before the world. All their data being in French, I had to translate this myself, some 60 pages or more, and to the younger members present I would point out the great advantage of making themselves thoroughly proficient in modern languages. If I had not known enough of the French language to do this work the priceless store of information in these Terre Noire researches would probably never have been appreciated by me, and my early alloy papers might not have been written at the time they were. It was this assistance, simple as it may be, which enabled me to be first in the field. It was also largely through the research and efforts of Terre Noire that it became possible to produce rich ferromanganese in the blast furnace, so that instead of costing £90 per ton, as it did, it can to-day be obtained for some £8 to £10 per ton. Their work has therefore proved of immense value to the world.

SIR ROBERT'S OWN WORK

Speaking of my own personal work, which I would fain avoid, but on an occasion like the present there seems no alternative, I may say that it required a considerable time, some 10 years or so later than the above-mentioned data, before my research bore fruit, manganese steel, as it is termed, being one of the first results. This, as you all know, is a world-wide product, and has found an important and useful place in the arts. I believe, too, that my work on this subject, which I presented to the Institution of Civil Engineers, also the Iron and Steel Institute in 1888 and 1889, was the first presentation of a systematic study with regard to the addition of a special element other than carbon added to and alloyed with iron. Faraday conceived the same idea of studying iron alloys about 1830, and had an interesting series of them made in Sheffield, but at that time the results were naturally imperfect in nature, and were not carried sufficiently far to be either of practical or scientific value. Since my first paper was read a wonderful race of alloy steels has been born, many of them now strong giants, interesting not only from a scientific point of view, but of great practical value. It was a great satisfaction to me when I found that my friend, Dr. Arnold, saw the great importance of this branch of research, and in his turn, with most valuable papers, many of them classics, has so vigorously helped on this important work.

Dr. Arnold, at an early age, grasped the point which many scientific men even now seem to fail to understand, namely, that to know and understand any particular or special kind of steel, also to be able to gauge its qualities, there must be thorough correlation in researches of this kind. Most scientific men in former days who were not metallurgists obtained specimens of steel upon which to experiment, and thought that it was quite sufficient to say that their examination had been carried out, for example, upon a bar of carbon steel; even if the carbon percentage was stated, there the data usually ended. We know now—as shown in my original papers in 1886 and onward, describing manganese iron or manganese steel, silicon steel, aluminum, nickel steel, chromium and tungsten, and many other iron alloys, and further followed up by the accurate work done by the head of our metallurgical department, Dr. Arnold—that we must have complete correlation, including not only composition but mechanical tests, microstructure, very complete chemical analysis—in many cases such data have now to be obtained with regard to twice the number of elements formerly determined—electrical and physical properties.

To fully understand the qualities of any particular type of iron or alloy steel is not an easy matter, and generally requires those having a particular and experienced turn of mind, combining not only scientific but practical knowledge. As mentioned in one of my papers 14 years ago—and it is as true to-day—"Never probably were the properties of any metal as much probed and examined as those of the metal iron and its alloys. It can be safely answered in the affirmative that the numerous physicians engaged in its diagnosis, guarding its welfare, curing its defects and improving its physique, will in the future as in the past obtain results rendering it of still greater use than ever before to mankind." Having until now been an unqualified practitioner, I can now claim, thanks to the honor you have paid me to-day, to be a fully qualified doctor. Just where the next improvement in the world of iron and steel is to take place I confess is very difficult to say. We want, and shall probably in due time get, another Bessemer, Siemens or Sorby; it may perhaps be some student now here, who knows? The marshal's baton may be in any knapsack; it is always there waiting to be grasped. The research work we metallurgists undertake represents the great truth of the Chinese proverb that he who holds the iron of the world will rule the world. It is not, however, merely holding the iron of the world—China herself does that, having, I believe, the largest known deposits—but understanding the properties of that metal which will make us masters of the metallurgical world.

HIS NUMEROUS PAPERS ON METALLURGY

After my first paper on manganese steel I followed this with a considerable number of other papers with regard to the effect of silicon, aluminum, chromium, nickel, cobalt, tungsten, copper and other elements upon iron. My labors have resulted in some 32 different papers, read before various scientific and technical societies. Among other discoveries, several of the steels I invented for electrical purposes have been found of great practical value. In a paper presented to one of the scientific societies, a well-known professor has stated that my inventions in these products alone have effected savings, in this country and abroad, amounting to figures which run not merely into thousands, but hundreds of thousands of pounds annually. To have given such assistance in the arts of peace is no little satisfaction to me.

My paper on "Experiments Relating to the Effect on Mechanical and Other Properties of Iron and Its Alloys Produced by Liquid Air Temperatures," in which I received such admirable assistance from Sir James Dewar, F. R. S., represented not fewer than 2000 individual observations, and contains data which I cannot help thinking will be found for many years to come of valuable practical assistance to the metallurgist.

It is indeed a great pleasure and satisfaction to find that the work I started in 1888 has borne such good fruit, and proved of benefit not only to my native city but more or less throughout the world. I would here acknowledge not only the cordial and valuable help I have received from those in my own research department, but also from many important scientific friends and metallurgists in this country, Europe and America. It has indeed been a great pleasure to me that my work has brought me into friendly personal and intimate touch with other fellow workers—alas! many of them gone from us—in the same and other fields, including not only those of my own city and nation, but in the great American republic and Europe.

CREDIT TO OTHERS

I will not weary you by reading the names of those to whom I refer, but give them in my printed notes, as they may be useful for reference by our younger men. The list is necessarily incomplete, and is one rather of a personal nature, representing chiefly those personally known to me; yet at the same time these names, I believe, represent most of those who have helped on metallurgy during the last 25 or 30 years. With nearly all of them I have been in touch regarding metallurgical research, either orally or by correspondence; in fact, I think the only one among this list whom I have not personally met was the late Sir William Siemens.

In Sheffield I refer to Sorby, Greenwood, Vickers, Reynolds, Hicks, Arnold, McWilliam, O'Shea, Williams, Ripper, Saniter and others. Elsewhere in England, Percy, Bessemer, Siemens, Snelus, Gilchrist, Richards, Martin, Abel, Bauermann, Kelvin, Baker, Bell, the Hopkinsons, Fleming, Ewing, Barrett, Lodge, Tutton, Mond, Crookes, Riley, Spencer, Roberts-Austen, Stead, Bottomley, Kennedy, Dewar, Turner, Rosenhain, Carpenter, Harbord and many others.

In Europe, Moissan, Osmond, H. le Chatelier, A. le Chatelier, Guillet, Pourcel, Frémont, Charpy, Grenet, Girod, Dumas, Guillaume, Ledebur, Wedding, Heyn, Ehrensberger, Martens, Borchers, Brinell, Akermann, Benedicks, Tschernoff.

In America, Fritz, Howe, Jones, Holley, Campbell, Raymond, Kirchhoff, Stoughton, Cushman, Sauveur, Knowlton, Burgess, Woodward, Dudley and many others.

As I have mentioned, the list does not pretend to be a complete one, and no doubt some names are omitted, but I have been personally in touch with nearly all those mentioned, and happily most of them are still with us.

To aid us in the continuance of this work, and to maintain our position in the world of metallurgy, we have now the valuable assistance of our university. I say most positively, and it is my firm conviction, Sheffield would not to-day hold the position it does—not merely on the scientific side but also the commercial—but for the work started in the applied science department of our university years ago by the foresight as well as the liberal financial assistance of those whose names I have previously referred to, including specially that by the late Mark Firth, Sir Frederick Mappin and Dr. Clifton Sorby, then wisely assisted by our City Council, both as regards financial and other assistance.

TRIBUTE TO SHEFFIELD UNIVERSITY

To my mind, if it had not been for the manner in which metallurgical training has been conducted by our university there is no doubt that more than one erroneous theory, with the attendant evils, which sooner or later have to be unlearned, would have arisen. Errors delay true advance, and one of them would have now held its sway, to the detriment (at least so it seems to me) of the true advancement of metallurgical science and knowledge. I refer to the allotropic theory of iron and the hardening of steel as being due to the presence of a so-called adamantine Beta form of iron. I say this with all respect to those who have fought against us. Thanks to our City Council's wise provisions, Dr. Arnold and his staff have been able by scientific research to show the error of this theory, and to-day Sheffield is to be congratulated upon having been the means by its correct research work of avoiding this pitfall. Here, therefore, we have a concrete example of the excellent work the Sheffield University has done. An error of this kind, powerfully supported as it has been, to be overcome has to be fought, and there are few who know the long, painful struggle and almost herculean efforts of those who have fought the battle.

In many respects I can truly and proudly claim that the work of our city represents the most sound and accurate metallurgical knowledge of the day. Long may we continue the good work of helping on and increasing this by scientific research. We have not selfishly kept such knowledge to ourselves, but freely disseminated it throughout the world. I do not think I am exaggerating when I state that we Sheffield men can claim to have unselfishly and freely contributed to the world more original research work in the metallurgy of iron and steel than any other section of our empire, or, in fact, of any other nation. This is a fact that Sheffield can well be proud of. Long may this healthy state of things continue, and let our past success be an incentive to the younger men coming up among us to continue the good work and to steadfastly run the race which is set before them.

It is no little satisfaction to be able to state these facts when there are still some in our midst who always seem to be thinking that old England is ever taking a back seat and has not kept up with the times. Nothing is farther from the truth, and again I say, let our successful efforts in the past be an encouragement for the younger men in our midst to continue to ever keep Hallamshire in the front rank.

OTHER NATIONS ENGAGED IN RESEARCH WORK

We must not forget that other nations are paying great attention to this question of research. The Reichsanstalt in Germany has done great work, and while I was in Washington I visited the Bureau of Standards, which I found to be admirably organized and equipped. The National Physical Laboratory, too, in this country is doing excellent work. Very large sums of money are freely granted, but money is not everything in research. At the back of it all are the brains which direct the research, and there is no reason why we should not in the future continue to lead in metallurgical research as we have done in the past.

I specially refer to this aspect of metallurgy because it enhances the value of the honorary degree of doctor of metallurgy, which has been wisely founded by our university and which you have only previously bestowed three times. Now it is my happy lot to receive this distinction, I want you to understand how much I value and appreciate it, coming as it does not only from my native city, but from a city which leads the science of metallurgy.

As I have said, do not let our past success cause us to rest on our oars. May I therefore here say a few words about the value of research, some of which I have referred to in a presidential address given some time ago, but which is quite as true to-day. In progressive manufacture, the complexity of which increases year by year, there are, in addition to the many ordinary difficulties met with, those of how to solve new problems which constantly present themselves. This can only be done by research, which should form an actual part of industrial operations and demands almost as much attention as is devoted to the manufacturing side.

I have recently received from Messrs. Krupp an interesting and most instructive booklet with regard to their new research laboratory, completed at enormous expense and thought. I congratulate them heartily upon their wise expenditure. Nothing is more calculated to keep their works in the prominent position it has occupied in the past. They, too, have given much research work freely to the world, and in no spirit of envy or ill-will should we begrudge advance by another nation. Science is cosmopolitan, free and open to all. The best will win the race. I, for one Englishman, am not afraid to face the future, and feel that if we are true to ourselves it contains an even brighter future than our glorious past, but do not let us rest upon our oars. As one who has carried out many researches in metallurgy, and has also benefited by the scientific investigation of others, not only in this country but elsewhere, I cannot too strongly insist upon the practical importance of research. It is more than ever necessary not to rest satisfied with the knowledge of to-day, or to think that this will satisfy the needs of to-morrow. Rapid and great changes are constantly occurring in metallurgy as in other branches of scientific knowledge. In the Royal Society, too, we have probably the most unselfish body of men in the world engaged in pure research.

Sir James Dewar has pointed out the comparatively small cost of research work, and that the whole cost of a century's research experiments at the Royal Institution, of which he is the able head, had been only about £120,000. What an insignificant sum to pay for the benefits mankind has received from the splendid investigations of Young, Davy, Faraday, Tyndall, Dewar himself and others! Yet most of these labors were carried out *honoris causa*, not for immediate material benefit.

Finally, may I say that the astronomer may investigate the worlds around us; the electrician, the physicist, the chemist and the mathematician may study phenomena of the greatest intricacy, but I venture to claim that the metallurgist, though his rank may appear somewhat humbler, yet has to solve problems not less difficult nor less important. Moreover, he must have a combination of knowledge not easy to acquire. He can therefore well claim that his profession entitles him to take a place round the council board of the international universities of science.

If we are inclined at times to think we have reached the height of human knowledge, let us remember the words of the late Lord Salisbury, no less a philosopher than a statesman: "We live in a small, bright oasis of knowledge, surrounded on all sides by a vast unexplored region of impenetrable mystery, and from age to age the strenuous labor of successive generations wins a small strip from the desert and pushes forward the boundary of knowledge."

Every year the Cleveland Engineering Society arranges an outing trip to inspect manufacturing plants of interest. This year it was decided to go to Lorain and visit the plants of the National Tube Company and the American Shipbuilding Company in that city. The trip was made September 12 in special cars on the Lake Shore Electric Railway. A large number of the members of the society attended and found much to interest them in looking over the two plants. Following its usual custom, the society has not been holding meetings during the summer. It will resume its regular sessions with a programme meeting September 26.

The New Comptometer

Designed for the Addition of Feet, Inches and Fractions

For use in drafting rooms and other lines of work involving the handling of plans a new model Comptometer has been brought out by the manufacturer, Felt & Tarrant Mfg. Company, 1713 North Paulina street, Chicago, Ill. This new type was especially designed for this class of work, and the distinguishing feature is the including of two columns of keys for the addition of inches and fractions of inches in eighths. This enables it to be used for the assembling of the detail measurements of overall dimensions in construction plans and eliminates the monotony of doing this work mentally. Fig. 1 shows the new machine, while one of the Comptometers in use in a drafting room is illustrated in Fig. 2.

Where a considerable number of measurements involving feet, inches and fractions of inches are to be collected and totaled by mental calculation it is first necessary to arrange them in a column and after reducing the fractions to a common denominator to add them up. With the Comptometer the same result is accomplished by merely pressing the keys corresponding to each whole number or fraction in feet and inches. In this way the adding and checking of detail measurements of a latticed column, a steel girder or a building plan becomes a purely mechanical operation, and one that is entirely automatic as far as the computation is concerned. Instead of assembling the measurements of rivet spacings indicated on a plan by first setting them down on paper and then footing them up, the draftsman sets the machine beside his work and collects the figures in succession by a single key stroke for each, whether it be a fraction, a whole number or an integer and a fraction. No error results if two or more keys are struck at once, and it is possible with a little practice to depress from four to eight keys simultaneously, the only restriction being that no two shall be in the same vertical column.

In addition to handling work of this nature the machine has a still wider range of usefulness, since it is equally well adapted to other forms of calculation common to engineering practice and general accounting. All computations involving addition, multiplication, division and subtraction can be readily performed. The method of operation is by no means intricate, since the machine is operated solely by keys like a typewriter. The touch system of operation can be employed just as well as with a typewriter, thus enabling the operator to concentrate his attention upon the work before him and so minimizing the danger of misreading figures, since the keys in a column are alternately concave and flat topped. Practically anyone who knows figures can learn how to add, multiply, divide or subtract in an hour, while speed and accuracy in every form of calculation are readily acquired by practice.

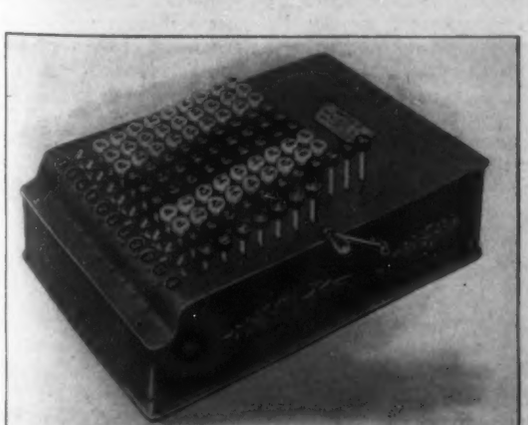


Fig. 1—A New Comptometer for Drafting Room Use Made by Felt & Tarrant Mfg. Company, Chicago, Ill.

One of the special fields for which the Comptometer is adapted is the making of estimates. In the office of a large structural steel contractor the engineering department makes up a bill of material for use in preparing estimates on the fabrication of structural steel for office buildings, bridges, etc., as soon as the drawings of the

Fig. 2—The Machine in Use.

structure are completed. This bill contains an itemized list of all the material of every description entering into the job, which for an ordinary office building of ten stories would include approximately 100 sheets of items to be figured and totaled. For making the calculations of the weight of steel and its value a 10-column machine is used. This work formerly required the services of three men working constantly, but with the Comptometer it is possible for one operator to do this work in about 60 per cent. of the time formerly required, the remainder being devoted to the figuring of material for the store keeping department, including material received from rolling mills and material issued on contract. All of these calculations are extensions involving multiplication. In addition to this ten-column machine the time-keeping department of this company employs an eight-column machine, which not only has taken the place of two clerks, but enables the work to be gone into much more in detail than was formerly the case. Other classes of work upon which one of these machines can be used include the figuring of stresses in a structure, with the accompanying large volume of calculations, compiling the data of tests with the result that a stenographer can be employed to do the figuring which formerly required the services of a high-priced member of the engineering staff, making up the pay roll, distributing the material, labor and other charges on a construction job and compiling operating records.

The File Trade.—A prominent file manufacturer describes conditions in that trade as exceedingly unsatisfactory. Business is not only very quiet but no indications yet appear of a revival of demand during the fall months. Buyers, for supply houses in particular, are making strong efforts to depress prices. Some of them, instead of asking for quotations, are making offers that are fully 25 per cent. below the market of the beginning of this year. The tendency of this attitude of the supply trade is to send the manufacturer directly to the consumer, even when the latter may desire to purchase only small quantities. It may be added, however, that hope has by no means been abandoned that a revival of some degree of activity may occur before the closing in of winter.

A natural gas well in Alberta, Canada, has tapped an enormous supply and is now running 29,000,000 cu. ft. a day. It eclipses in volume anything hitherto found on this continent.

Atlas Crude-Oil Engine

New Diesel-Type Engine with Noteworthy Performance

The impetus which the use of crude oil as engine fuel has been gathering and the contemporaneous development which the fuel oil engine has undergone are conspicuously shown in the new Diesel-type crude-oil engine which the Atlas Engine Works, Indianapolis, Ind., has brought out. The fact that the new engines are large in size—300, 450 and 600 hp., for example—and the prominent identification for years with the steam engine industry of the Atlas Engine Works speak much for that institution's belief in the future of the fuel oil engine. In fact the record of the Diesel engine, both here and abroad, in manufacturing plants and on war and merchant vessels has brought forth the expression from the company that it is the machine destined to replace steam power. It is to be recalled that the wide and large use of gasoline has, in its distillation from crude petroleum, produced supplies of fuel oil much in excess of the demand. The admitted high thermal efficiency of the internal combustion engine is the other factor of importance and the Diesel engine works under the four-stroke cycle without needing ignition devices or carburetors, a peculiarity regarded as highly favorable from an engineering and commercial standpoint.

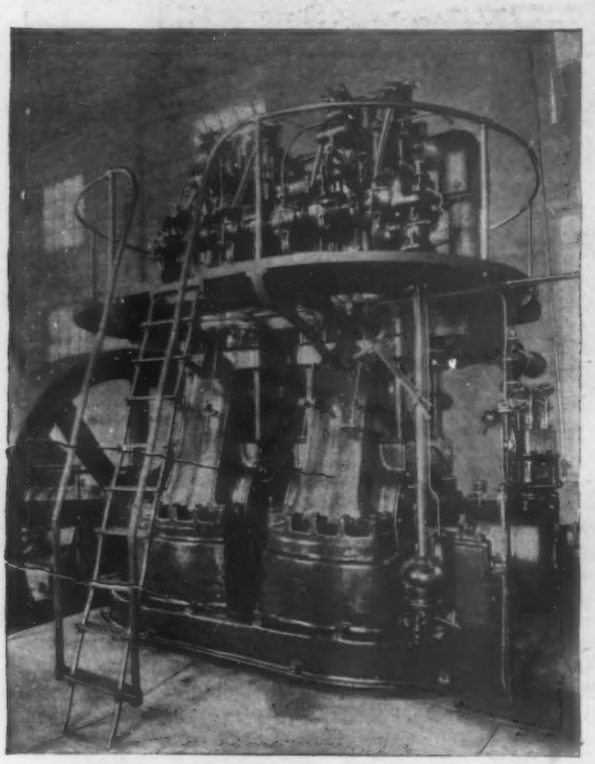


Fig. 1.—Atlas Crude-Oil Diesel-Type Engine Built by the Atlas Engine Works, Indianapolis.

The accompanying illustrations will assist in gaining an idea of the Atlas oil engine. Simplicity in operating parts and measures to maintain a maximum of the inherent high efficiency of the type of engine are emphasized. It is not felt necessary to refer to the general arguments in favor of the oil prime mover, such as small space requirements as compared with the steam-engine equipment. In the first stroke of a cycle air is drawn into the cylinder; then the air is compressed on the next or return stroke, developing a temperature of about 1000 deg. F.; then, on the working stroke, a fine spray of oil is gradually and steadily injected into the cylinder, and, the temperature of the compressed being high enough, gradual combustion ensues without explosion. The oil supply is dependent on the power requirements of the moment, controlled by the governing mechanism, and indicator cards show that the pressure and temperature in the cylinder do not rise appreciably above that due to the compression of the air, or 500 lb., and that the burning of the oil produces an impulse having a time element and relieved gradually with the expansion of the burned charge. The fourth stroke is the usual scavenging action, to rid the cylinder of the products of combustion. The temperature for ignition, as explained, is obtained solely by compression of the atmospheric air, without heater, hot plate, magneto or other device. The spray of oil, which is mixed with a jet of air at 900 lb. pressure, is introduced through a small nozzle during one-tenth of the working stroke, at a rate calculated to maintain temperature and pressure practically constant during the combustion period.

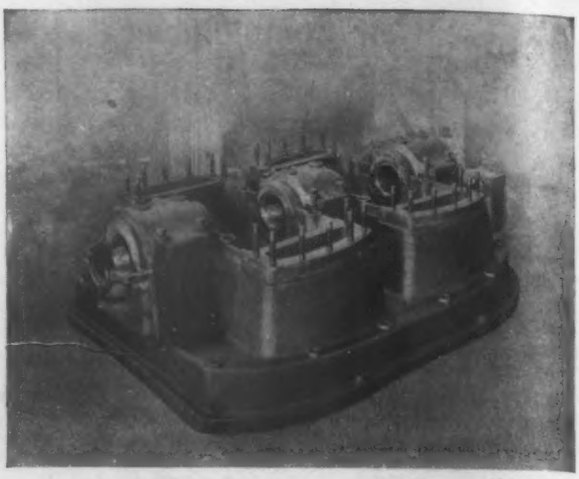


Fig. 2.—Base of the Atlas Crude-Oil Engine.

The engine is of the vertical single-acting inclosed type. The base, shown in Fig. 2, is a single deep casting containing housings for the main bearings and forming reservoirs for crank lubricating oil. The A-frame over each crank is cast in one piece with cylinder and water jacket. All valves, admission, exhaust, fuel, starting and relief, are attached to the cylinder heads, and are accessible from the outside, and need not be disturbed when the heads are taken off. They are driven by positive means and the lay shaft with eccentrics and cams is shown in Fig. 3. The pistons are of the long trunk type.

The general economy of the engine is indicated in some tests made by C. E. Sargent, mechanical engineer, Chicago, covering performance for different loads. A two-cylinder engine, with 20 x 30 in. cylinders, direct connected to a 250-volt, direct-current Fort Wayne generator of 175-kw.

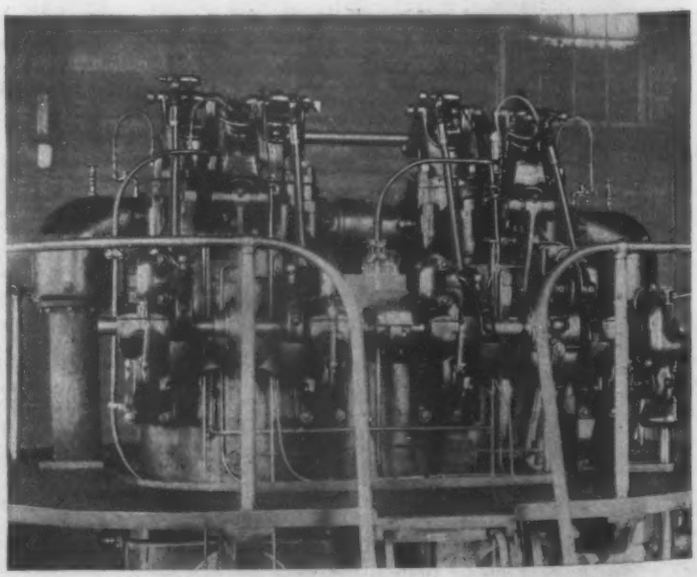


Fig. 3.—Valve Mechanism and Gallery from Which it is Accessible.

capacity, run at 175 r.p.m., and working in parallel with the remainder of a works' power plant, was tested. A shop load of lights and motors was used, maintained as near constant as possible by hand manipulation of a rheostat. The engine had run about 2800 hr. under load. The results, a table of which has been taken from Mr. Sargent's report, showed that the oil consumption per 100 kw.-hr. was less than 10 gal. through a wide range of load. The engine developed 1 b.h.p. on less than ½ lb. of fuel oil, which at the average calorific value of 19,000 to 19,500 B.t.u. per pound and a weight of 7.3 lb. per gallon, gives for oil costing 2 cents per gallon 100 kw. of power for a 10-hr. day for $2.

Copies of the Sargent test will, it is stated, be sent to those whom the company thinks are sufficiently interested, but an illustrated book has been prepared for general distribution, discussing the subject of the engine and comparative motors in an usually interesting and instructive style. For example, it is shown how the crude oil engines saves about 45 per cent. of the heat required to operate a producer gas plant, and about 80 per cent. over steam in continuous operation, not to mention that no fuel is consumed when the engine is not running. The Sargent report gives the logs of the different tests and sample indicator cards, which are highly elucidating, and besides commending the design speaks of the speed regulation as not surpassed by the best Corliss engines.

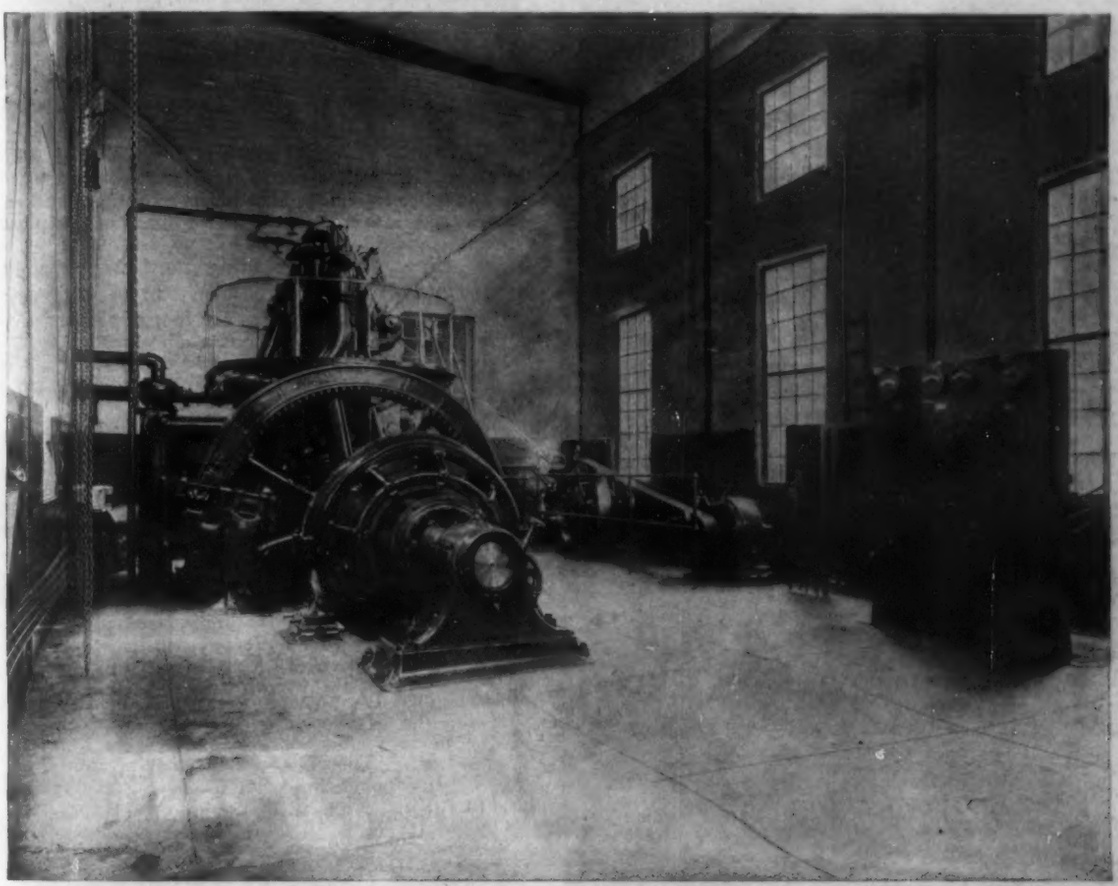


Fig. 4.—Complete Installation of a 300-b. h.p. Atlas Oil Engine Direct-connected to a 200-kw. Electric Generator.

The American Institute of Chemical Engineers will hold its fourth annual meeting in Washington, D. C., December 20, 21 and 22. Papers will be presented on the general subject of patents and on the manufacture and testing of explosives as well as on a number of other important chemical engineering subjects. One day will probably be devoted to visits to the technical chemical engineering plants in Baltimore and vicinity. Visits to laboratories and other points of interest in Washington will also be arranged. John C. Olsen, Polytechnic Institute, Brooklyn, N. Y., is secretary.

The structural section of the Engineers' Society of Western Pennsylvania held its first fall meeting in the society rooms, Oliver Building, Pittsburgh, on September 5. The meeting was devoted to a general discussion of nonmetallic roofing materials. The principal paper was read by W. S. Babcock, waterproofing engineer of the Barrett Mfg. Company, New York, on "Built-up Roofs." A discussion on concrete roofs was led by W. M. Kinney, inspecting engineer Universal Portland Cement Company, Pittsburgh. A discussion on Carey roofing was led by C. R. Kirkpatrick, superintendent of construction Philip Carey Company, Chicago.

One Steel Corporation Investigation Ended

Concerning the inquiry into labor conditions, trade methods and other phases of the operations of the United States Steel Corporation, which the Department of Commerce and Labor has had under way for some time, Secretary Nagel is quoted as follows:

"We have about completed our investigation of the Steel trust, which will cover several volumes, containing as many words as a big family Bible. In investigating a corporation we start to know its purpose; to learn whether it carries on business in accordance with its charter; its methods, profits and losses, wages and prices, costs of materials; whether it has combinations with railroads whereby it gets unfair advantages, and whether it is in a conspiracy to control or make prices. The Steel trust gave us great aid, throwing open all its books. This has been so with most corporations. It was not so with the Tobacco trust, but the recent decision may make that organization more compliant. At the end of the last fiscal year work was still pending on the lumber, steel and tobacco industries, International Harvester, water transportation and concentration of water power. Some of this work has since been completed. We are now making a directory of business houses which handle imported merchandise in all foreign countries."

E. H. Titchener & Co., Binghamton, N. Y., are constructing an addition to their factory, 42 x 50 ft., which will provide necessary additional room. The firm manufactures staples, wire shapes, nails, double-pointed tacks, etc.

The Sintering of Mayari Iron Ores in Cuba*

Transportation, Handling and Nodulizing Equipment of the Spanish-American Iron Company—The Plants at Felton and Woodfred

BY JAMES E. LITTLE, STEELTON, PA.

Of the several extensive deposits of brown iron ore in Cuba, including those of Mayari and Moa, that of Maayri was the first to be systematically explored, and was selected as the scene of the first operations in the development of this class of ore. Construction work, begun in the spring of 1907, involved the building of 16 miles of standard gauge railroad and two large double-track inclines, the installation of mining machinery, a nodulizing plant, power plant, shops and shipping facilities, and the dredging of an extensive basin for deep draught vessels. Unusual weather conditions delayed the completion of

Fig. 1.—View from the Top of the Lower Incline Connecting Mayari Mountain with the Gravity Yard at Piedra Gorda.

portions of this work, so that the entire plant was not in operation until December, 1909.

The ore in its natural state contains a very large percentage of water, which increases to some extent with the depth below the surface. Near the surface it is red in color, with somewhat granular structure. The color gradually changes with depth, finally reaching a bright yellow. The consistency also changes towards the bottom to a clay-like, sticky mass. The relative proportion of red and yellow ore is quite variable; in some places the yellow reaches close to the surface, while in others the red extends almost to the underlying serpentine.

General Features of the Mining and Transportation Systems

The ore of the Mayari division of the Spanish-American Iron Company lies on an irregular plateau about 15 miles long and 5 miles wide at the widest point, entirely covered with pine trees and brush, which grow directly on the ore. The elevation at the northern extremity, which is approached by the railroad, is about 1700 ft. above sea level. At the southern end the general elevation is about 2000 ft. Ore is removed by means of scraper-bucket excavators and steam shovels, these machines loading into special standard gauge, side-dump steel cars of 100,000 lb. capacity. A short haul brings these cars to the head of an inclined plane, 6800 ft. long, and of varying grades from 6 to 25 per cent. From the foot of this upper incline there is a short railroad about a mile long to the head of a second incline, 1950 ft. long and of 25 per cent. inclination. This lower incline ends in a gravity yard at an elevation of 130 ft.

The ore is therefore lowered by the inclines and connecting railroad through 1491 ft. vertical height, from elevation 1621 to elevation 130, the track distance being 2.44 miles. Both inclines are double track, 14 ft. center to center. Empty cars coming up on one track partly counterbalance loaded cars descending on the other track.

The main cables, 3 in. in diameter, pass over heavy drums, 20 ft. in diameter, at the head of each incline. Each end of the cable is securely fastened to a "barney" car, against the spring buffer of which the ore car rests. The speed is controlled by a steam engine geared to the drums and by post brakes operated by steam.

From the gravity yard at Piedra Gorda, at the foot of the lower incline, ore is carried over a single track standard-gauge line, 13.45 miles long, to Felton on Nipe bay, where a nodulizing plant for drying and sintering the ore is situated. The name Felton was selected for the principal town in honor of Edgar C. Felton, the president of the Pennsylvania Steel Company, of which the Spanish-American Iron Company is a subsidiary corporation.

The nodules produced are stocked under a traveling bridge at the wharf in position for prompt loading with grab buckets into vessels for shipment to the United States.

The common labor employed comes principally from the northern provinces of Spain. Many Cuban mechanics and laborers and a few Jamaicans are also employed. There is, of course, quite a colony of American engineers, clerks, mechanics and others holding positions of responsibility.

The mining settlement, Woodfred, so named in honor of the president of the Maryland Steel Company, is magnificently situated on the ridge of Mayari mountain, overlooking the beautiful Mayari valley, studded with royal palm groves and tobacco fields, and in the distance the sugar cane fields of the Nipe Bay Company along the shores of Nipe Bay and Banes Bay.

The contour of the ground at the point where excavations were begun, though appearing to be quite regular, is not ideal for steam shovel operation. The depth of ore is not uniform, in many places the underlying rock projecting far up into the ore, even to the surface. The general slope of the ground, even in the most nearly level places, is quite irregular. Therefore, it is difficult to find many places where it is possible to operate a steam shovel for an extended period in a cut of economical depth, without including a considerable portion of the rock with the ore excavated. For this reason the scraper-bucket excavators are more satisfactory as well as more economical for excavation, although their capacity is considerably less

*From a paper prepared for the Wilkes-Barre, Pa., meeting of the American Institute of Mining Engineers and published in the Bulletin of the Institute for August, 1911. Articles on the Mayari iron mines appeared in *The Iron Age* of August 15, 1907, p. 421; April 9, 1908, p. 1149; August 26, 1909, p. 614; April 13, 1911, p. 914.

than that of the large size shovel used. Three of these excavators are now at work, together with one 90-ton Bucyrus steam shovel. The excavators operate 1.25 cu. yd.

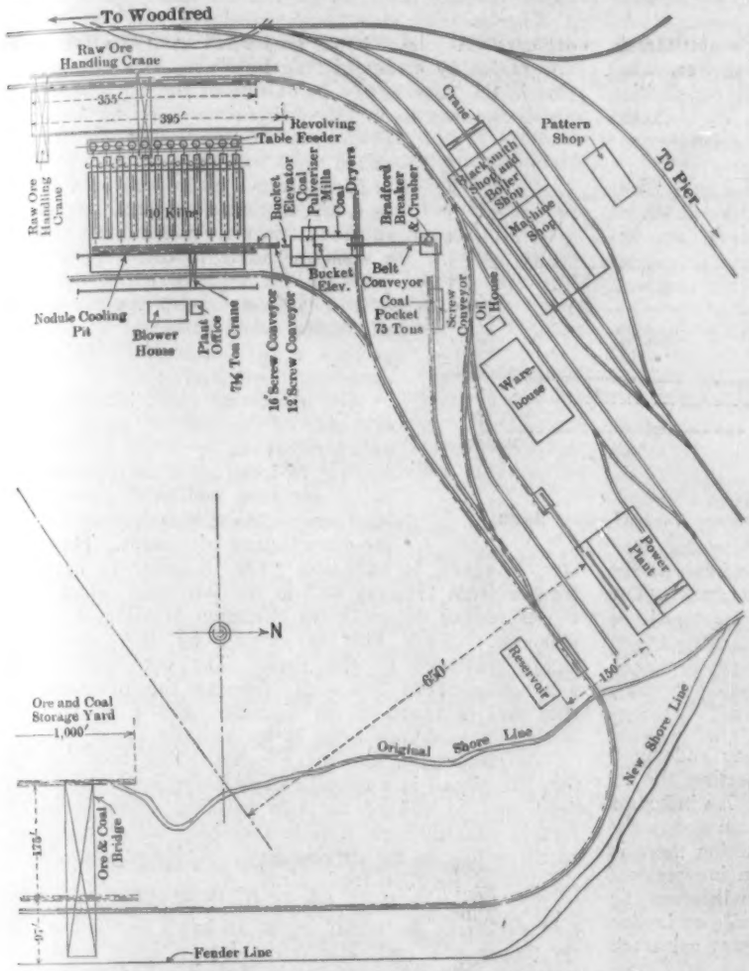


Fig. 2.—Plan of Works at Felton.

Page buckets, although a larger capacity of bucket is contemplated. The bucket swings through a radius of 60 ft. and without difficulty removes all the ore for a width of about 100 ft. down to the rock bottom, the projecting rock and stumps being discarded. Each machine crew consists of one operator, one fireman, and three pitmen.

Operation of the Ore Incline

As the machine works up hill or down hill continually, and the track alongside follows the same grade, cars can be dropped down by gravity to be loaded as needed, with a minimum amount of locomotive service. Three heavy shifter type locomotives serve the shovel and excavators, and deliver cars to the head of the upper incline. Here the tracks have grades arranged so that cars, when the brakes are released, will run to the incline and the empties coming up will run off on another track. At present two cars are lowered over the incline at once, although when desired three cars may be so handled. A brakeman travels up and down with each car to control the brakes at the beginning and end of the trip.

Both inclines are operated on the tail rope system, the main cable on the upper incline being 3 in. in diameter, of six strands of 19 wires each, of plow steel, with a 1⅛-in. independent wire-rope center, the latter also having six strands of 19 wires twisted around a hemp core. Its breaking strength is estimated at 377 tons. The total length of this cable, manufactured by the John A. Roebling's Sons Company, is 7810 ft., and its weight exceeded 123,000 lb. The successful manufacture, transportation and installation of this unusual cable in its present position is a feat of engineering well worthy of notice. Along the track at intervals are rollers, 10 in. in diameter, supporting the cable. These rollers, turned from well-seasoned native hard wood, are carried by a 1/5-in. axle which runs in simple hard wood bearings spiked to two ties.

At the upper end of the incline the cable passes over two drums, 20 ft. in diameter, set tandem, both carrying heavy gears which mesh with a common pinion, 58.5 in. in diameter, on a center line between the drums. There half turns are made over each drum by the cable. The pinion shaft is also the crank shaft of a pair of 30 x 30-in. vertical engines which are used in accelerating the moving parts and to carry the cars over certain parts of the incline where the descending loaded cars are on too low a grade to pull the empties up a steeper grade. On each drum are two pairs of post brakes operated by steam, the load being applied by a weighted lever acting through an eccentric. The surface of the drum is lagged with hard wood for the brake shoes to act upon. Grooved wooden lagging is also used on these drums for the cable to pass over. The drums are carried on a shaft 24 in. in diameter in center, with bearings 21 in. in diameter. The construction of the drums and machinery is very massive.

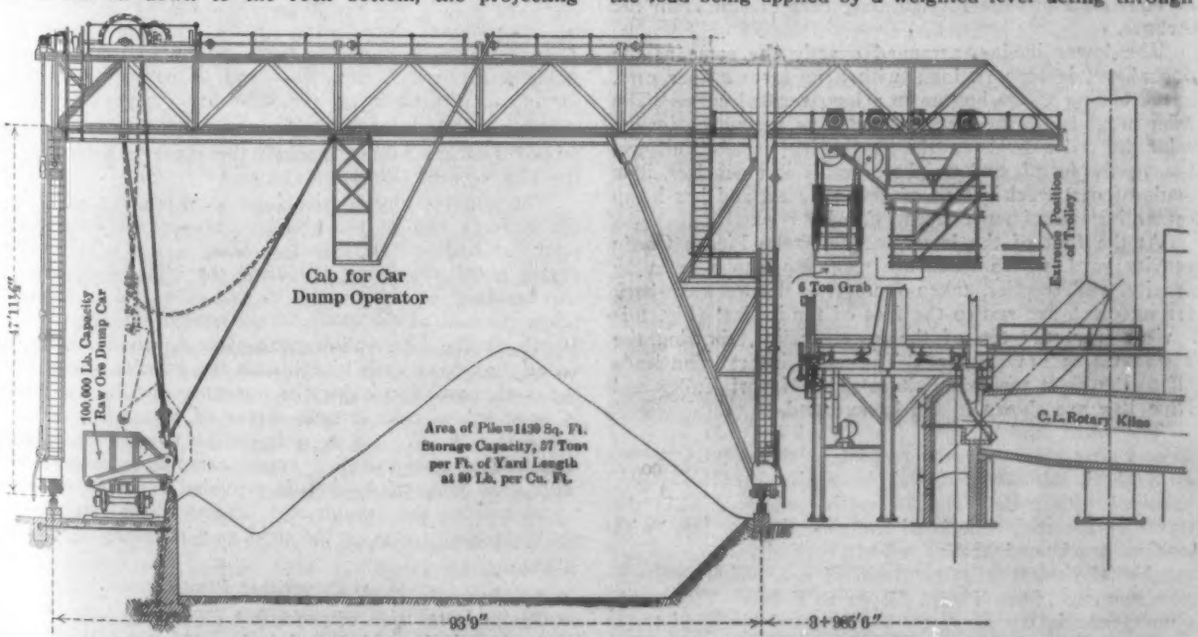

Cab for Car Dump Operator
100,000 Lb. Capacity Raw Ore Dump Car
6 Ton Grab
Extreme Position of Trolley
C.L. Rotary Kilns
Area of Pile=1139 Sq. Ft.
Storage Capacity, 57 Tons per Ft. of Yard Length at 80 Lb. per Cu. Ft.
93'9"
3+985'6"

Fig. 3.—Section Through Raw Ore Yard and Feed End of Kilns (Looking South.)

steel castings being used for almost all parts. All of this material was furnished by the Nordberg Mfg. Company of Milwaukee, Wis.

The machinery house is 221 ft. back from the head of the incline in order to provide for the crossover tracks from either incline track to load and to empty track. Spring switches are used except one, which is free, being thrown by empty cars coming up to the correct position for the next loaded cars going down. Safety switches

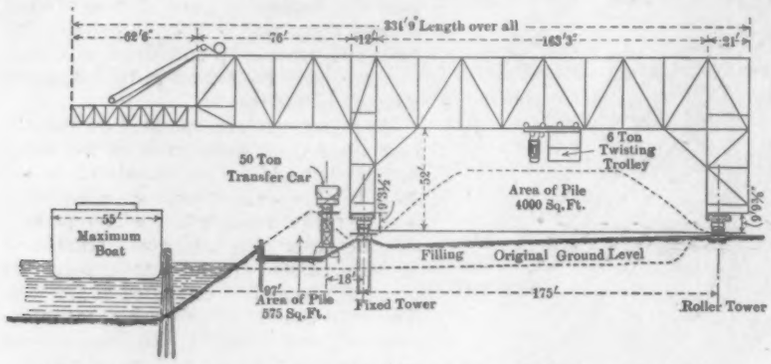


Fig. 4.—Section Through Ore and Coal Storage Yard (Looking South).

are located on the mine railroad and at the head of the incline to prevent damage by cars running away. The contour of the upper incline, starting from the top, is as follows:

582 lin. ft. on 25 per cent. grade.
2175 lin. ft. on 17 per cent. grade.
1917 lin. ft. on 6 per cent. grade.
1829 lin. ft. on 25 per cent. grade.

At the foot of the last slope the contour ends in a parabolic vertical curve 700 ft. long, connecting the 25 per cent. grade with the 1.4 per cent. grade. An indicator in front of the operator in the machinery room shows the position of the cars during the trip. In addition there is a complete electric bell signal system and an independent telephone line to provide for communication between the top and bottom of the inclines. The main rails on incline are 100 lb. per yard. Between these is a barney car track of 36-in. gauge, using 56 lb. per yard rails.

The connecting railroad from the foot of the upper incline to the top of the lower line is arranged with suitable crossover tracks so as to facilitate handling the cars up and down by one locomotive, which is of the same type as those used on the mine railroad. Gravity tracks at both ends provide for handling cars to and from the inclines.

The lower incline, arranged exactly the same as the one above, is 1950 ft. long, with a uniform 25 per cent. grade ending at the bottom in a long vertical curve. The cable used is of the same diameter as the upper incline cable in order to keep the machinery details uniform, but, as the length and weight of cable is much less, it is made of cast steel instead of crucible steel and has hemp center instead of an independent wire rope.

At the foot of the lower incline is the Piedra Gorda gravity yard, where loads are made up into a train by gravity, and empties, taken from train by a switch-back arrangement, are run to the foot of the incline. Fig. 1 is a view from the top of the lower incline, showing the Piedra Gorda gravity yard. The main line railroad leads off to the right towards Felton. The Mayari Valley and Nipe Bay are shown in the background.

The main line railroad from Piedra Gorda yard to Felton, first class in every respect, is single track, 90-lb. A. S. C. E. standard rails, laid on native hard wood ties, ballasted with rock. The locomotive which handles the trains on the main line is of the consolidation type, with leading truck and trailer wheels, cylinders 19 x 24 in., capable of hauling a 45-car train of ore, weighing about 3200 net tons, from Piedra Gorda to Felton. The maximum grade is 0.5 per cent. in favor of loads, and the maximum curve is 6 deg. All bridges are of steel.

The Nodulizing Kilns

At Felton, the terminal on Nipe Bay, the trains, after weighing the cars, are delivered to a track on the west side of the raw ore yard, where one side of a car rests on a sill wall. A plan of the works at Felton is given in Fig. 2, and Fig. 3 is a section through the raw ore yard and the feed end of kilns, looking north. The full length of the yard is 750 ft. Two electric gantries carrying trolleys with 6-ton grab buckets cover this distance and handle the ore from the yard to the kiln feeders.

The gantries also carry machinery for dumping the ore cars. A pair of hooks suspended from hoisting drums are guided by means of "tag lines" so as to engage with pins in the door on the front side of the car. In raising, the door turns about hinge pins situated on the back side of the car so that when the door is raised to its full hight, through about 90 deg., its frame is in position to serve as a link in lifting the back side of the car body off of the under frame through a sufficient angle to discharge its load over the sill wall on which the front of the car body rests. As a rule cars will dump when raised to 45 deg.; or perhaps a little higher, if the ore is particularly wet and sticky.

The nodulizing plant, located on the east side of the raw ore yard, consists of 12 rotary kilns, 10 ft. in diameter, and 125 ft. long, set at an inclination of 5/8 in. per foot, and 20 ft. apart. The kilns are of the type commonly used in the manufacture of cement. The diameter, however, is unusually large in order to overcome trouble from "ringing up" in the hot zone, which often causes serious delays in the operation of kilns of smaller diameter. Each kiln is carried by two steel tires rigidly fastened to the shell. The cut steel driving gear attached to the shell close to the tire near the cold end is 152.78 in. in diameter, and 4 in. in pitch. Each kiln is driven by a 35-hp. variable speed motor.

To protect the kiln drive motors from heat and dirt they are placed in a tunnel of reinforced concrete running from end to end of the kiln building. Belts from the motors pass through slots in the side wall of the tunnel to the pulley on the driving gear. A fan at each end of the tunnel supplies fresh air.

The kilns are lined for 85 ft. from the hot end with 9-in. firebrick; the remaining 40 ft. has a 6-in. lining. At the upper end each kiln opens into a brick hood connected to the stack, 78 in. in diameter and 90 ft. high above the center of the kiln.

The device for feeding the raw ore into kilns is very simple and effective. A table 19.5 ft. in diameter is revolved at a speed of about one revolution per hour. One side is kept filled with ore by a grab bucket on the raw ore yard gantry, the cantilever extension of which covers the feeder table. Under the edge of the kiln side of the feeder table is a wide hopper ending in a chute set at a steep angle. The ore is gradually and regularly plowed off the table by a fixed deflector, which makes an acute angle with the direction of motion of the ore on the table. The ore falling through the chute is delivered to the kiln several feet from the end.

The sintered ore in the form of nodules falls from the delivery end of the kiln to an open cast-iron chute set at an angle slightly steeper than 30 deg. This chute passes under the floor, delivering the nodules outside of the building into a trough 12 ft. wide and 9 ft. deep below the end of the chute. This trough extends the full length of the kiln building, 240 ft. A small stream of water runs down each trough with the nodules, facilitating the motion and furnishing the water for cooling. A pump is provided to remove any excess of water in order to maintain a depth of 8 or 9 ft. in the trough. A 7.5-ton overhead electric traveling crane, carrying a man trolley with 3 cu. yd. grab bucket, is provided for removing the nodules from the trough and loading them into 50-ton electric transfer cars on the track passing alongside of the trough.

Coal Pulverizing Plant

On the north side of the kiln building the coal pulverizing plant is located. Coal is brought from the wharf in the same transfer cars as are used for removing nodules. It first passes through a Bradford breaker and a roll crusher, which break it down to 0.75-in. size and less, at the same time removing the foreign materials. Crushed coal is taken from the crusher by an 18-in. belt conveyor to the 150-ton storage bin. From the bottom of this bin the coal runs into two rotary driers 48 in. in

diameter, 30 ft. long, in which it is dried to 0.5 per cent. or less of moisture, in order to be in condition for pulverizing. The dried coal is elevated by a bucket elevator to a small bin, which feeds to four 42-in. Fuller-Lehigh pulverizers placed in two pairs on either side of the screw conveyors into which the pulverized coal falls from the bottom of the pulverizers. Motors for driving the Fuller mills, driers, elevators and conveyors are placed in dust-proof brick buildings on either side of the main building; the shafting extending through the walls carries the driving pulleys.

The pulverized coal from the screw conveyors under the mills is taken by bucket elevators to a 16-in. screw conveyor about 300 ft. long, with an opening in the bottom for supplying the coal to small bins opposite each kiln. The bottom of each bin forms a hopper for a short screw which feeds the coal regularly to the low pressure burners.

The blast, 9 oz. pressure at the nozzle of the fan, is supplied by four Buffalo blowers, situated in a separate building to the east of the kiln building. All blowers deliver into a common pipe, which passes over the nodule crane runway, down into the kiln building, and to the various kiln burners.

Ore Storage and Loading

At the wharf is a stockyard 1000 ft. long, covered by two electrically operated ore bridges, one carrying a 15-ton trolley and grab for handling ore, the second a 6-ton grab to be used principally for unloading coal and also as an auxiliary ore bridge. Both bridges have a main span of 175 ft. and a cantilever extension on the water side 90 ft. long, to the end of which is hinged an additional 60 ft. to carry the trolley out over the hatches of vessels in loading ore or unloading coal. The latter extension or boom is arranged to be lifted to clear the ships' upper works in moving from hatch to hatch. Fig. 4 is a section of the ore and coal storage yard, looking south.

The construction at the water front is somewhat unusual. Close to the front leg of the bridge, and parallel to its runway, is a trestle extending over one side of a trough. A transfer car brings the nodules from the nodulizing plant and discharges from one side into this trough in position to be readily loaded into the vessel, or to be moved back to storage under the main span of the bridge by the grab buckets. The bottom of the trough is 1 ft. above high tide. Its outer wall is formed by planking spiked to a row of piles. All of this construction being above the water line, it is not subject to damage by the *teredo navalis*. From the outside of the trough wall the bottom drops off at an angle of 45 deg. to 8 ft. deep at the fender line, which is approximately under the hinge of the boom of the bridge.

Considerable dredging was necessary in order to provide a suitable harbor. A basin 1500 ft. long, 200 ft. wide at each end and 400 ft. wide at the widest point was dredged to a depth of 28 ft. The approach channel, 2500 ft. long and 200 ft. width, was dredged to the same depth. Felton on Cagimaya Bay, a well-protected branch on the south side of Nipe Bay close to its entrance, has proved a very safe and satisfactory harbor.

Shops, Power Plant, Etc.

As a part of the Felton plant a large repair shop has been installed, with ample machine tool equipment, foundry, blacksmith shop and car and boiler repair equipment. The main floor and the yard on the west end are covered by a 30-ton overhead electric traveling crane. All except the smallest machine tools are individually driven by electric motors. A well-arranged lavatory and toilet room is provided for the comfort of the employees. The building covers a space 120 by 260 ft. In a separate building is a carpenter and pattern shop, 40 x 90 ft., containing a sawmill. Near the machine shop is a general warehouse, of steel, 70 x 150 ft., included in which is a bonded warehouse for the use of officials of the Cuban Custom House.

Nearby is the electric power plant, in which are installed three 500-kw., 250-volt, direct-current Crocker-Wheeler generators. Steam is furnished by two batteries of Babcock & Wilcox boilers, each of 880 boiler hp. capacity, operating at 150 lb. pressure. The engines are cross-compound Wisconsin Corliss, with cylinders 20 x 40 x 42 in. Weiss barometric condensers with auxiliary pumps complete the equipment. Coal is delivered to a bin at the west end of the building by the electric transfer car; from this bin it is taken by conveyor to a crusher, and subsequently elevated and conveyed to an overhead suspended bunker, under which is a chute for feeding the hoppers of the stokers. Ashes are handled by an elevator and delivered to a car on a track alongside of building. All the plant buildings are of substantial steel construction covered with corrugated iron, and in most cases having a concrete floor.

To provide accommodation for employees, towns have been established at Felton and at Woodfred. The Felton establishment includes two hotels, three *fondas* or eating houses, a steam laundry, bakery, general store, butcher shop, ice plant, and many dwelling houses of different grades. The general water supply comes from the Mayari River, which is crossed by main line railroad, about 11.5 miles from Felton. At this point water is pumped to a tank on the top of a nearby hill, from which it flows by gravity through an 8-in. pipe line to Felton.

At Woodfred a well-equipped hospital has been established under the care of a competent physician and surgeon. Its situation on top of Mayari Mountain is ideal for the purpose. The branch hospital at Felton cares for accident cases and is used also as a dispensary. Sanitary conditions, both at Felton and at Woodfred, are carefully guarded, so that the percentage of sickness among employees is very low.

In addition to the wharf for the receipt of coal and the shipment of ore, there is a pier constructed of creosoted pine, 1700 ft. long, to a point where 25-ft. depth of water is reached. This pier is used for the receipt of general merchandise and machinery and for local passengers. Transportation of ore and coal is handled at present by chartered steamers, ore being delivered to the Maryland Steel Company at Sparrow's Point, Md.

Nipe Bay is a growing seaport, with weekly communication with New York by the Royal Mail Steam Packet Steamers. It is also served by the bi-weekly service of the Munson Line. It lies on the north coast of Cuba, almost directly north of Santiago de Cuba. The northeast trade winds, which blow perhaps from 60 to 80 per cent. of the time, moderate the temperature and make this part of Cuba quite a desirable location for an American colony.

Copper Production and Stock in August

The Copper Producers' Association has issued the following statement for August:

	Lb.
Stock of marketable copper of all kinds on hand at all points in the United States, August 1	137,738,858
Production of marketable copper in the United States from all domestic and foreign sources during August	125,493,667
Deliveries of marketable copper during August:	
For domestic consumption	59,935,364
For export	69,855,660
Total	129,791,024
Stock of marketable copper of all kinds on hand at all points in the United States, September 1	133,441,501

This shows a decrease in stock of 4,297,357 lb. The stock of copper held in the United States is now lower than at any other time since February 1 of the current year. While the reduction in the past month was not so great as in July, it nevertheless shows a continued movement in the right direction.

The Hope Engineering & Supply Company, Pittsburgh, has secured the services of Louis Bendit as manager of its Western office, in the New York Life Building, Kansas City, Mo. He will have associated with him a corps of experienced engineers and will be prepared to give careful attention to all inquiries in consulting and contracting engineering along the line of natural gas. He will also have charge of its sales agencies of Miller gas and oil engines, 25 to 400 hp.; C. & G. Cooper gas engines, 300 to 2000 hp.; Hammon gas pipe couplers, and Sprague gas meters.

The Rateau Steam Regenerator Company, 140 Cedar street, New York, is advised that the Court of Appeals, Hamm, Germany, has sustained the basic Rateau patents on steam regenerators, issuing a permanent injunction against all infringers.

New Atlas Ore Car

For handling ore in steel plants the Atlas Car & Mfg. Company, Cleveland, Ohio, has recently designed and built three scale cars for the Warwick Iron & Steel Company, Pottstown, Pa. The special features of the new design are simplicity of construction and operation, the speed with which the load can be dumped and a form of construction that is claimed to eliminate practically all

A New Scale Car for Handling Ore in Steel Plants Built by the Atlas Car & Mfg. Company, Cleveland, Ohio.

danger of injury to its motor equipment by improper operation.

Heavy steel construction is employed throughout. The car is dumped by hand by a lever conveniently located in front of the hopper and directly back of the motor controller. The dumping lever opens a two-part discharge door which swings out under the center of the trucks and the load is discharged almost instantaneously. The hopper is suspended from a steel frame by springs to protect the scales from jarring. The controller and the weighing mechanism are located at the forward end of the car. The lever connecting with the motor controller regulates the speed, and as this cannot exceed a certain predetermined maximum the motors, it is emphasized, cannot be injured by an inexperienced or careless operator.

The scales, which have a capacity of 20,000 lb., will weigh within 5 lb. of the actual weight, it is stated, and are designed to weigh separately various ore mixtures which may be placed in the hopper to form a load. The scale consists of five loose beams and one main or tare beam, arranged one above the other, and contained in a metal weigh box which can be locked if desired. The capacity of the main beam is the full capacity of the scale, 20,000 lb., while one of the other beams will weigh 15,000 lb., two of the remaining four will weigh 7500 lb., and the other two 5000 lb. each. At the top of the weigh box is a double plus and minus beam marked at 500 lb. on either side of the zero point, its purpose being to enable the operator to determine over or under weight on any beam. In weighing the load the weight is first placed on the minus side of the center at a point which will cause the beam to balance when the load is within a certain amount of that desired. The weight is then placed at the zero point in the center of the beam and additional material placed in the car. If an excess load is delivered the weight is moved to the plus side until it balances it, the excess is noted and the over-weight deducted from the load delivered to the car on its next trip.

The axles run in malleable iron boxes having malleable pedestals and high-grade bronze bearings. The wheels used are of heavy chilled cast iron with ground treads. Two 12½-hp. Westinghouse motors are used to propel the car and the device for controlling the current passing to the motors was made by Electric Controller & Mfg. Company, Cleveland, Ohio.

The following table gives the principal dimensions and specifications of the car:

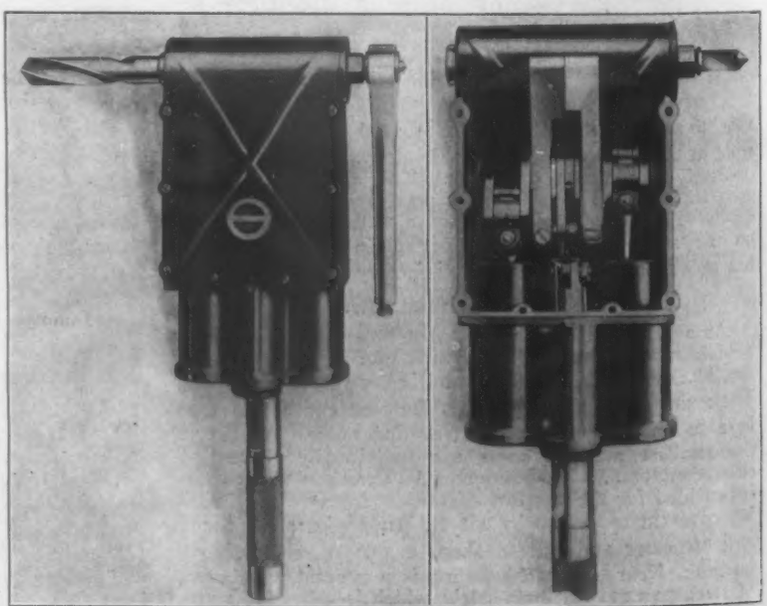
Overall length, ft.	16 5/6
Width, ft.	7½
Height of car above rail, ft.	6
Size of discharge door opening, ft.	2x4
Capacity, lb.	6
Capacity, cu. ft.	125
Diameter of wheels, in.	28
Gauge of track, in.	3½

Air Drill for Close Quarters

A new close quarter piston air drill, designed for drilling, reaming and tapping in narrow places where a center-spindle drill cannot be used, has been brought out by the Cleveland Pneumatic Tool Company, Cleveland, Ohio. This machine will drill within 1⅛ in. of a side wall or a corner. It is simple in construction, and its makers claim that it has fewer parts than any similar type of corner drill. The drill is made in two sizes, No. 38, with a capacity of a 1¼-in. hole, and No. 49, that will drive a 2-in. twist drill. The accompanying illustrations show an interior and an exterior view of the drill. In both machines the distance from the throttle connection to the outside of the spindle casing is 12 in.; the length of feed 2 in.; the distance from the center of the spindle to the outside of the casing, 1⅛ in.; the width of the casing at the spindle, 6 in. The distance from the point of the feed screw to the end of the socket is 8½ in. in the smaller machine and 9⅝ in. in the larger. Each weighs 26 lb. The spindle speed when running light with 80-lb. air pressure is 240 r.p.m. in the smaller drill and 120 r.p.m. in the larger.

The spindle is placed at the extreme forward end of the machine and the throttle handle at the rear end. The motor consists of two double-acting pistons connected to a crank shaft, which is mounted on annular ball bearings and is provided with eccentric disks. The disks are connected by eccentric straps to two piston valves which control the two cylinders, each valve controlling one cylinder. The air is taken in centrally between the cylinders. Power is transmitted from the driving crank to the spindle by ratchet levers which are connected to opposite wrists of the driving crank, their opposing ends alternately engaging ratchet teeth cut on the spindle.

The body of the machine is a single piece steel casting with the piston and valve cylinders cast integral. The advantage claimed for the single piece construction is that it insures perfect alignment for all working parts, doing away with screws, bolts or other attachments to fasten the cylinders to the casing. Owing to the position of the spindle in the extreme forward end and the throttle handle at the rear end considerable stress is thrown on the casing when the drill is running, and with the cylinders and casing in one piece danger of the cylinders



A New Close Quarter Piston Air Drill Made by the Cleveland Pneumatic Tool Company, Cleveland, Ohio.

coming loose from the casing is avoided. The casing is provided with large hand holes, through which access is easily had to the crank and connections. These permit the filling of the case with hard grease for lubricating the active parts and the cover plate seals the machine against oil leakage. The crank, connecting rod, ratchet levers, ratchet pawls, eccentric straps and caps are drop forged. The drill sockets are made to receive the entire length of standard Morse taper drill bits.

Westinghouse Air Brake Business

The Westinghouse Air Brake Company, Pittsburgh, whose works are at Wilmerding, Pa., has purchased a site at Emeryville, Cal., on which it will commence the erection of a large plant for the manufacture of its various products. The plant is not being established with a view of catering to the Oriental trade of the company, as reported, but simply for the purpose of taking care of its Pacific coast business. The company has experienced trouble in making shipments across the continent, as some times damage was done to machinery, and by locating a plant on the coast this trouble will be avoided.

So far in its current fiscal year the business of the Westinghouse Air Brake Company has held up remarkably well. It has received a very large amount of new business from the Interborough Rapid Transit Company, New York City, in connection with the alterations that have been made by the latter, so that it can run 10-car trains. These 10-car trains are being equipped with Westinghouse appliances throughout. Numerous other railroads are installing the new patented brake which the company has perfected, and it is also receiving a large number of inquiries from additional railroads regarding them. The company is operating its plant to a fair rate of capacity with considerable business on its books, and regards the outlook as fairly satisfactory.

Text Book and Blue Print Holder

Patents have been applied for by Robert H. Smith, Massachusetts Institute of Technology, Boston, Mass., on a combination text book and blue print holder. The use of this holder is shown in Fig. 1, while Fig. 2 illustrates the way in which it is attached to the back of a lathe and Fig. 3 gives details of its construction. Among the special advantages claimed for the holder are a saving of time with a corresponding increase in the efficiency of the workman by providing a device for holding a print or drawing, while eye strain is also eliminated as the line of vision is perpendicular. Prints or drawings when held by this holder are not likely to be soiled or damaged and in addition they are kept in the best position for rapid reading.

The print is held in position by gravity as there are no springs, clips or hooks connected with the holder. Referring to the upper portion of Fig. 3, which shows some of the constructional details of the holder, it will be noticed that it is composed of a vertical rod, *a*, on which are mounted two movable parts, *b* and *c*. The upper one of these is free to slide on the vertical rod and its weight holds the mounted print *d* in place. Unmounted prints are held near the upper edge of the inclined surfaces *e* and *f* of the two movable parts, which combine the weight of the weighted lift forming the lower portion of the upper movable member *b* with that of an inclined plane. The part *c* can be adjusted vertically on the rod to locate the print at the proper hight. The rod *a* is attached by a bracket to the machine, as shown in Fig. 2, or if the holder is intended for bench use, a round base is provided.

The text book holder, shown in Fig. 1 in use on the same rod with the blue print holder, has a weighted hinge or flap, *g*, Fig. 3, with handles on both ends, which rest on the upper margin of the book. The weight of this part holds the book open, while a transparent celluloid cover, *h*, fastened to and operated by the hinge, keeps the book clean. If desired the blue print and the text book holders can be used separately on the rod instead of in combination as shown in Fig. 1.

Fig. 1.—The Holder in Use. Fig. 2.—Manner of Fastening Holder.

Two Views of a Combination Text Book and Blue Print Holder Patented by Robert H. Smith, Boston, Mass.

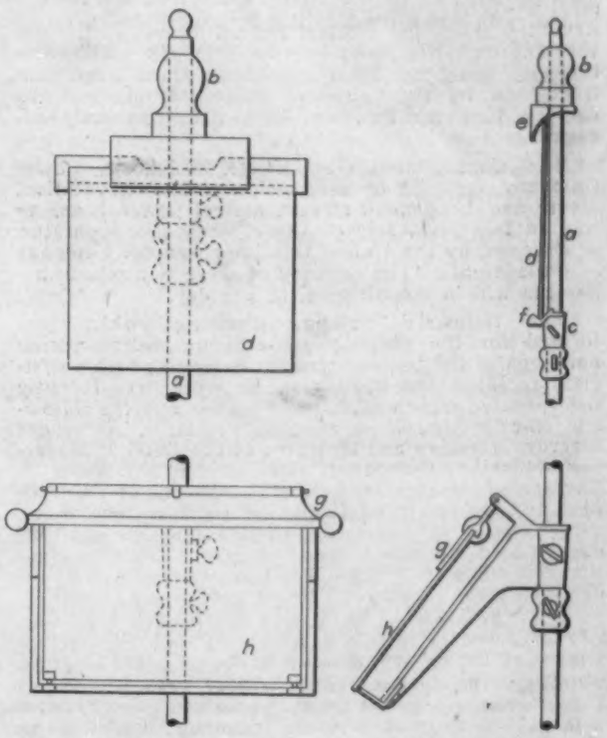


Fig. 3.—Details of the Two Holders.

An unusual public electric service is promised for New York if the plan goes through of the Longacre Electric Light & Power Company, which has been granted a franchise to operate in New York City. It is stated that while the company intends to erect one or more power houses within the city, it realizes that there are isolated electric plants in numerous buildings operating sometimes at considerably low rates of capacity, and that by using together such stations on common mains it would be possible to run the various plants at a more economical load and at the same time give to all these stations a break-down connection, in allowing the current to feed back into any particular building in the event of a failure of its own plant. It is stated that the company, which has offices at 165 Broadway, New York, has offered to purchase excess current from the smaller plants at 1½ cents per kw.-hr. during the daytime and at 1¼ cents during the night.

Baltimore Industrial Notes

Dietrich Brothers have been very busy with work in hand, but note some irregularity in new business, particularly during the closing weeks of the month. A fair amount of small and moderate contracts for structural work have been taken in the South, one for the structural work for Normal School Building No. 162, Washington, D. C., and one for a church building in this city being the most important. Two large contracts, one for the Baltimore Bargain House and one for the Casualty Building, keep the plant fully engaged.

The Consolidated Gas, Electric Light & Power Company is building at its Spring Garden Station, Heath and Leadenball streets, a steel power house to contain two 12-ft. sets of Lowe water gas apparatus, as designed by the United Gas Improvement Company of Philadelphia. The capacity of these two sets of apparatus will be 6,000,000 cu. ft. per day.

The Industrial Building Company, which was formed for the purpose of erecting manufacturing buildings of the beehive type, in order to provide first-class facilities for small manufacturers, was recently incorporated with a capital of $300,000, and the following officers have been elected: President, Alexander Harvey, secretary and treasurer of the Detrick & Harvey Machine Company; vice-president, William J. Champion, president and general manager of the William J. Chapman Coal Company; secretary and treasurer, Charles M. Cohn, vice-president of the Consolidated Gas & Electric Power Company. The first plant that this company will build in this city is now well under way, being located at Preston and Clifton streets.

The Chesapeake Iron Works has booked a number of small orders for both structural and ornamental iron work. The local demand has been rather inactive, although a promising amount of new work is developing, particularly in the South. Bids are going out on a fair amount of new projects, including an addition to the Valentine Warehouse, Richmond, Va., requiring about 150 tons of structural work. Orders recently taken by this company include one for the structural and ornamental work for 31 sets of stairways, for various school buildings in Allegheny County, Md.

Municipal contracts, in which the local iron, steel and machinery equipment trade have been interested, have not been very numerous. Considerable work in connection with sewerage propositions are, however, up for proposals.

The Baltimore Bridge Company has taken on quite a satisfactory volume of business the past month and now has the capacity of its plant pretty well engaged for several months ahead. Export trade has figured considerably in contracts recently closed by this concern, including one for 20 spans of bridge work, varying from 12 to 200 ft. long, for extensions on the San Miguel Railway, Guatemala, South America. Two hundred and forty plate girders, 45 ft. long and 6 ft. deep, aggregating about 1300 tons and the steel work for eight cargo cranes, are to be supplied to the Isthmian Canal Commission. A number of moderate contracts for local work have also been taken, including one for the steel work for a warehouse for the Baltimore and Ohio Railroad at Henderson's wharf, Canton.

The Western Maryland Railway Company is making plans for a large expenditure of money in the construction and equipment of terminals in this city and also at other points along its line. About $7,000,000 will be expended in this work, which, however, will no doubt be extended over a long period of time. Tentative plans include the providing of modern yards at Port Covington and Hillen Station, where suitable property has been purchased. At Port Covington plans include two new piers, and a new warehouse will probably be built at Hillen Station. The Western Maryland is extending its connections with other lines and is planning for a very much larger freight traffic through this city. At the present time no definite plans have been completed, although the clearing of sites for the proposed work in this city is now going on.

The Frederick Railway Company has petitioned the Public Service Commission for authority to purchase the minority interests in the Frederick Gas & Electric Company, Frederick, Md. These interests consist of common and preferred stock valued at about $50,000.

Plans are being considered by municipal and railroad engineers for the erection of a new bridge over the Baltimore & Ohio Railroad at Monroe street, near the Mount Clare shops, steel and concrete, spanning some 25 or more tracks.

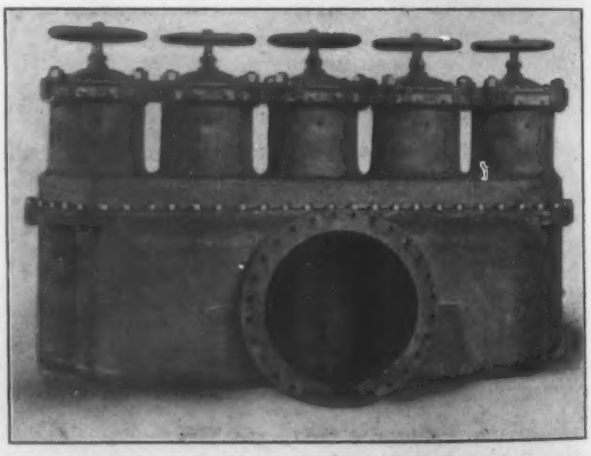
It is currently reported that the Pennsylvania Railroad contemplates the erection of a new viaduct on Lafayette street, from Pulaski to Smallwood streets.

Large Lagonda Strainers

What are claimed to be the two largest water strainers ever built were recently completed by the Lagonda Mfg. Company, Springfield, Ohio. They are intended to remove the solid matter held in suspension in circulating and feed water and were furnished to two large railway concerns, one being supplied to the Toledo Railways & Light Company, Toledo, Ohio, and the other to the Metropolitn Street Railway Company, Kansas City, Mo. The general construction of these strainers does not differ very materially from the multiple strainer illustrated in *The Iron Age*, October 6, 1910, but the interesting feature about them is their size. The width measured from one end to the other is 10 ft. 1¼ in. and the hight from the bottom flange to the top of the hand wheel is 6 ft. 1 in. The total weight of each strainer is 11,000 lb.

The strainer consists of a cast-iron body lined with bronze having five strainer baskets which can be easily removed for cleaning without shutting down the pump. The water enters through the inlet pipe, passes up to the top of the valve chamber, where it divides, and finally goes down through all the baskets in multiple. With but three of the baskets in service an area greater than that of the 30-in. pipe in which the strainer is connected is provided, and with all five in service the total straining area is several times that of the supply pipe.

While these strainers are of massive dimensions little difficulty is said to be encountered in removing the basket for cleaning purposes. To clean a basket it is simply necessary to turn the hand wheel over the chamber



An Exceptionally Large Water Strainer Built by the Lagonda Mfg. Company, Springfield, Ohio.

corresponding to it. This operation raises the basket entirely out of the strainer and at the same time shuts off the water from that particular compartment. A small by-pass relieves the pressure in this chamber, the bolts at the top are loosened and the top flange is raised. This exposes the basket, which can now be taken out and cleaned. When the basket is replaced the operations are precisely the reverse, and the motion of the hand wheel lowers the basket from the upper part of the chamber into the straining position, and at the same time lifts the valve disk on the bottom of the basket from its seat on the valve collar, which is also raised from the valve. If by any chance there should be an obstruction resting upon the upper valve collar, the basket as it is being raised to the cleaning position will tend to tilt the obstruction either into the basket or out of the way of the valve, since the basket travels almost as high as the full distance before the lower valve disk comes in contact with the lower seat of the valve collar.

In service it is recommended that at least one basket be kept in reserve in the upper portion of the strainer body, so when it is desired to clean the strainer this spare basket can be quickly dropped into the strainer body and the other baskets removed one at a time.

Mechanical Equipment of the New York Central Terminal

Details of the Various Apparatus Installed

BY CHARLES H. HUGHES, NEW YORK.

The improvements of the New York Central Railroad in New York City are interesting not only on account of their magnitude, but also of the engineering problems which had to be solved. Briefly, they included pulling down a station which for years was one of the finest in the country, an office building and a train shed; a general enlargement of the terminal yard necessitating the demolishing of some 200 houses and the removal of 2,500,000 cu. yd. of material, the erection of a new station, office buildings and power plant and the electrification of the road for 35 miles from the city. Work was started in 1902 and it is expected that the improvements will be completed in 1913 or 1914.

The enlarged yard is nearly 1700 ft. long by 1000 ft. wide, covering an area of 43 acres and having 17.5 miles of track. At the southern end is the Grand Central Station with a 600-ft. frontage on Forty-second street, on the east the Grand Central Palace and at the north is the boiler house.

The Boiler House

The boiler house is the central unit from which will be distributed all the supplies common to an up-to-date terminal, which include a heating system, electric lighting plant, compressed air system, hot and cold water for domestic and fire purposes, hydraulic elevator pumps for baggage elevators, turbo-generators and the necessary operating appliances.

The generating units are in a building about 88 ft. wide by 150 ft. long, at the northern corners of which are two large stacks and at the southern two towers. The structure is built over the train yard, the supporting columns being placed between the tracks. There are three floors; the first is for pumps, heaters, etc., the second for air compressors, generators and boilers, the third for boilers, and over the boilers on the third floor is the coal bunker.

At present only the boilers on the second floor are installed, and these comprise 10 Heine safety water tube boilers with superheaters, arranged in five batteries, a row of three being on one side and two on the other. Three of the batteries have a capacity of 1270 hp. each and the other two of 1100 hp. The arrangement of the boilers on the third floor will be the same as those on the second, the uptakes from both entering common flues exhausting into the stacks. The stacks are of steel, lined with firebrick, and are surrounded by diagonally steel braced towers.

The coal bunker has a capacity of 3000 tons, the coal being raised by a steam-driven balanced skip hoist and belt conveyors or by a crane, so that the bunker can be filled from cars or from wagons on the street. From the bunkers are chutes that deliver the coal to the furnaces which are hand fired.

The boilers are equipped for forced draft, air being supplied below the grates. Each row has its own duct connected to a double inlet steam-driven fan having a capacity of 40,000 cu. ft. per minute. The fan can be driven by either one of two vertical steam engines, only one of which is in use at a time, the other being for emergency.

Building Heating System

The heating system for the terminal area is the largest of its kind in the world. It is of the hot water forced circulation type with three separate pressures, each being a unit by itself and so maintained at the boiler house. All are designed on the loop principle which is followed in the buildings to be heated. For example, a molecule of water leaving the boiler house travels in one continuous direction, the same distance as any other molecule of water, so that there is a constant differential head between the supply and return mains and branches throughout the terminal area.

It is to be noted that three pressures, viz., low, intermediate and high, are employed, necessitating three separate lines of supply and return mains. The low pressure is for heating all buildings up to the sixth story, the intermediate up to the twelfth and the high above the twelfth.

Water for the system is heated by the exhaust steam from the turbines, compressors and pumps, which exhaust into a large cast-iron header that has branches to heaters through which the water is forced by centrifugal pumps. Each heater has a capacity of 6000 gal. per minute. There are now three heaters installed, but provision is made for the installation of future ones as may be required. The system is laid out so when additions are made they will be along the same general lines as at present followed, ultimately giving a total capacity sufficient to heat 170,000,000 cu. ft. of building space. This is equivalent to fully 17 office buildings equal in size to the 13-story Grand Central Palace occupying the block from Forty-sixth to Forty-seventh streets. A further idea of the size can be obtained from the fact that the terminal area around which the heating mains extend has a perimeter of over a mile. Each building is heated from a branch taken from the main loop. Van Stone joints with improved square shoulders are used and all the pipes are heavily covered with non-conducting material.

Lighting

To the west of the boiler house there is contemplated, and the boiler house is planned for it, the erection of a machinery house in which will be rotary converters for transforming the current from the Port Morris and Yonkers power stations, so as to be available for terminal purposes. Steam-driven generators will eventually be installed for furnishing electricity, for should an accident happen to the converters the steam units could at once be brought into use.

All the buildings are wired for standard 120-240-volt direct current, and they are supplied from the generating equipment at the boiler house, switchboards being installed in every building from which the light and power circuits are carried. The yards, where covered, have incandescent lights with switches easily available. The platforms have lights controlled by push buttons at the ends.

Pumps

The elevators in the office portion of the Grand Central Station are electrically operated and those in the baggage hydraulic. Both are run by power furnished by the boiler house. The pumps for the hydraulic elevators are situated over 1500 ft. away from the elevators themselves, and as the pumps are above the operating valves of the elevators a back pressure system was designed for the elevators to operate against, so they would force the water in their descent up into surge tanks, which are of sufficient hight to cause the water to flow back to the pumps in the boiler house. There are at present about 26 passenger and freight and 14 baggage elevators in operation.

Compressed air for terminal purposes is supplied by two Corliss valve air compressors having a combined capacity of 3000 cu. ft. per minute. The air is used for filling car brake tanks, baggage checking tubes, cleaning and the like.

For fire protection there are two steam and one electric pump with a combined capacity of 3500 gal. per minute. Tanks having a capacity of 60,000 gal. are provided for water storage purposes. The pumps for the plumbing service and the fire protection system can be operated interchangeably by using reducing valves.

Under the platforms and along all yard storage and cleaning tracks there are hundreds of service outlets so placed as to be reached quickly. These outlets consist of cold water for car cleaning, steam for car heating and compressed air for brake testing and car cleaning, thus providing for every service requirement.

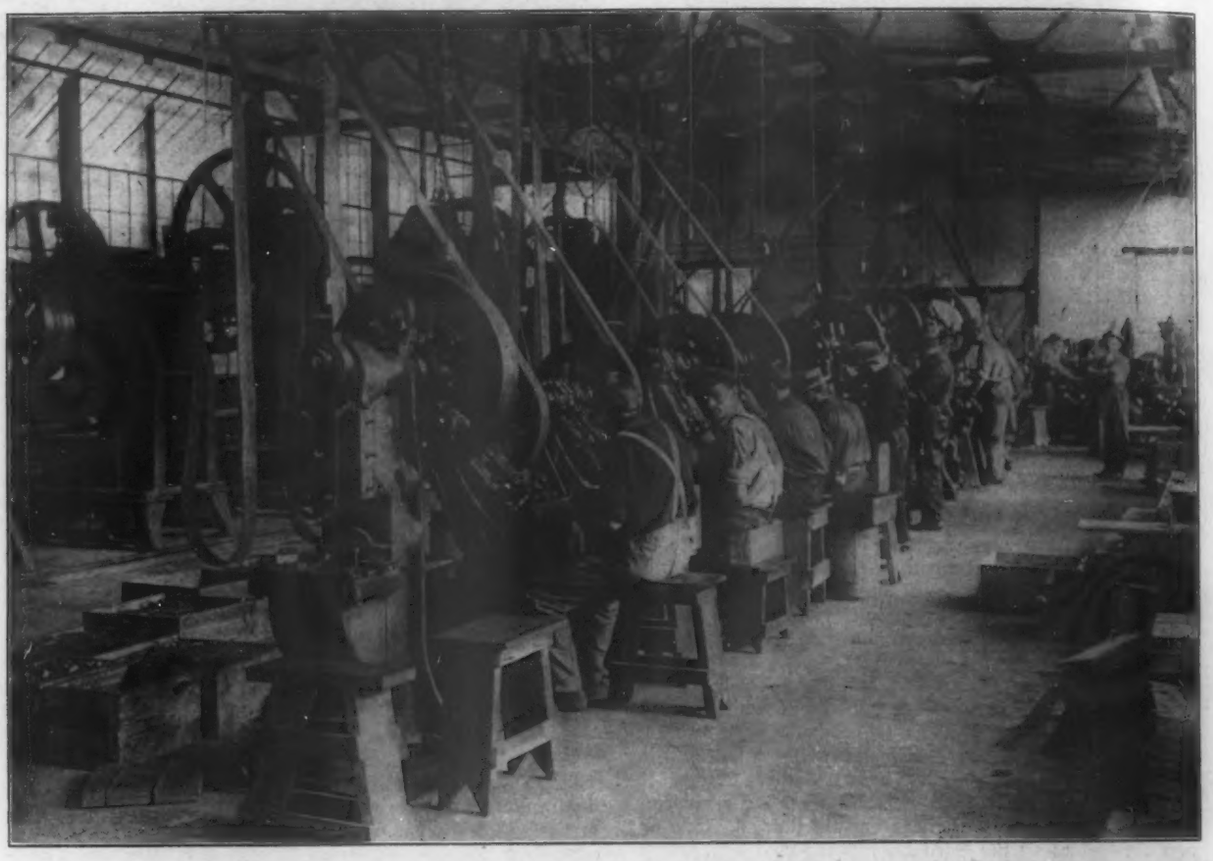
The design of the boiler house and service plant equipment with the mechanical and electrical arrangements for the Grand Central Terminal yards and buildings was made by the Grand Central Station architects, C. A. Reed, executive, and Clyde R. Place, mechanical engineer in consultation with W. G. Carlton, superintendent of power for the terminal company.

Correction.—In the announcement of the three-spindle vertical drilling machine built by Hanford & Barkley, German Insurance Building, Rochester, N. Y., which appeared in *The Iron Age* of August 24 on page 434, it was erroneously stated that the production of car journal boxes on a rotary side planer was 450 pieces per day. This figure should have been 100 pieces.

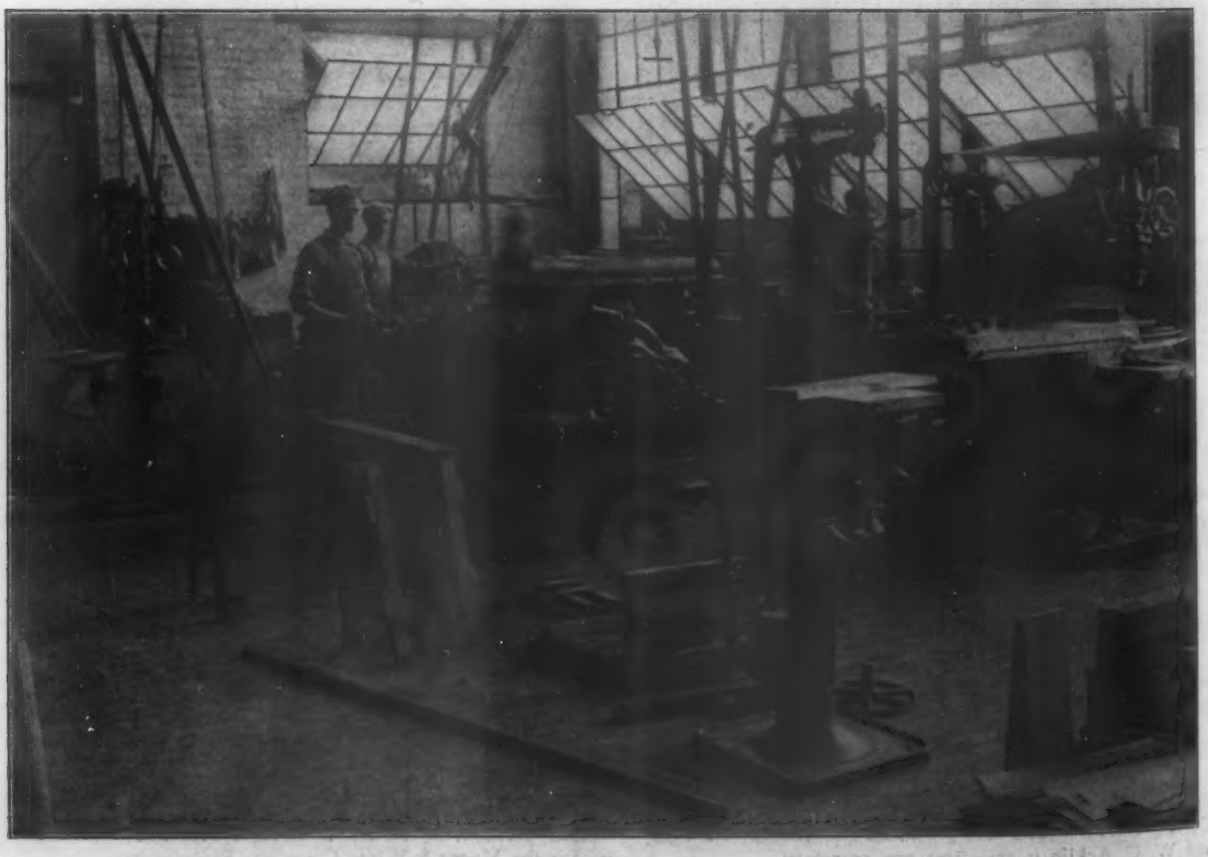
A Toledo Metal Stamping Plant

An insight into the housing, equipment and arrangement of a plant for producing stampings in steel, brass, aluminum and other metals may be gained from a new factory in Toledo, Ohio, designed for the purpose, for a business established by a number of individuals familiar with what the modern development in sheet metal machinery and manipulation offers. It is the works of the Acklin Stamping Company, at 1645 to 1653 Dorr street, Toledo, one of the recent additions to the manufacturing industries of that city, and the accompanying reproductions of photographs are given for the suggestions they may make to others contemplating plant extensions.

The Acklin Stamping Company was incorporated in



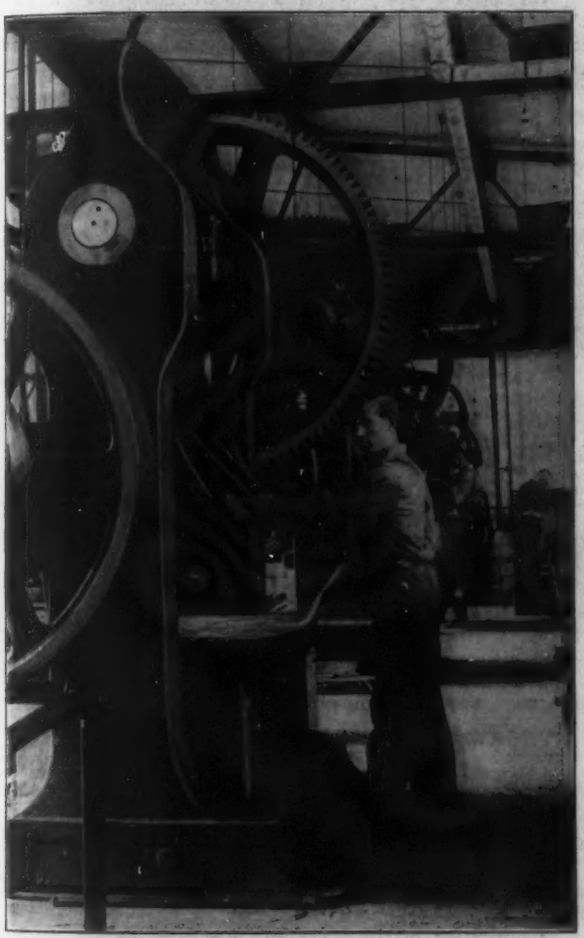
Interior View Showing Excellent Light in the Plant of the Acklin Stamping Company, Toledo, Ohio.



A Corner of the Tool Room

April of this year and purchased land in the new manufacturing district adjacent to the Lake Shore Railroad. Devore & McGormley, architects, prepared the plans for a fireproof, strictly modern building on the land, which is 150 x 110 ft. One of the illustrations shows that close attention was paid to the question of light. The building is heavy and rigid in its construction, the flooring being laid on a thick bed of concrete, bringing about an absence of vibration.

The business is to be confined exclusively to the production of sheet metal stampings. A full complement of presses has been installed, the largest ones weighing 50,000 lb. each, so that a wide range of work may be undertaken. The presses are of a special nature and massive in con-



A Corner of the Press Room Showing Massive Construction of Machinery

struction. This latter feature is to ensure close and accurate stampings not possible in the ordinary press. A corner of the large press room is shown, giving an idea of the massiveness of the machinery.

When equipping the plant special care was taken to provide safety devices which will eliminate the dangers to which press operators are liable. The dies used are fitted with chutes and the necessary fixtures for carrying the blanks and shells into the various positions in the dies so that the operator is not compelled to place himself in dangerous positions. The company is also a believer in the use of compound dies to do away with unnecessary handling of the work. While these are more expensive to construct and to keep up on work in large quantities, they are found to effect a saving through less time and labor required. A corner of the tool room is shown in one of the cuts.

Although the business was begun only in July the company has already secured a large number of desirable contracts, it is stated, and numbers among its customers some of the most substantial manufacturing concerns in the country. Jeremiah Bingham, who is recognized as one of the experts of the country in sheet metal work, is superintendent and mechanical engineer; James M. Acklin, a graduate of one of the Engineering Schools of Cornell University, is vice-president and general manager, and W. C. Acklin is treasurer and secretary.

Pittsburgh and Vicinity Business Notes

After an investigation extending over many months, the Portsmouth Steel Company, Portsmouth, Ohio, has placed with Tate, Jones & Co., Inc, Pittsburgh, an order for their swinging type of fuel-oil burners for six open-hearth furnaces, with reversing-valve stands for each furnace, No. 3 oil-pumping system, etc., complete. This makes a total of 82 open-hearth furnaces throughout the United States and Canada equipped with Tate, Jones & Co.'s fuel-oil burners and reversing-valve stands.

The Vulcan Crucible Steel Company, Aliquippa, Pa., reports the following officers elected for the coming year: Samuel G. Stafford, president and general manager; Joseph A. Kelly, vice-president; W. A. Campbell, secretary and treasurer. The board of directors consists of W. A. Shaw, Charles Bailey, Joseph A. Kelly, W. A. Campbell and S. G. Stafford. The volume of business it is receiving at the present time is reported to be very fair, with good prospects for business this winter. A new catalogue on vanadium steels is in preparation and will be issued shortly.

The Westinghouse Electric & Mfg. Company has received an order from the Warren Street Railway Company, Warren, Pa., for five double equipments of No. 307 motors with type K-36-F control, and from the Boston Elevated Railroad Company, Boston, Mass., for 50 additional quadruple equipments of No. 306 motors with type H L control.

The Sistersville Electric Light & Power Company, Sistersville, W. Va., has placed an order with the Mesta Machine Company, Pittsburgh, for one 20 x 24-in. twin tandem, horizontal, double-acting, four-cycle gas engine. The engine will operate with natural gas and is rated at 1000 b.h.p., being arranged for direct connection to a 650-kw., 60 cycle, 2300-volt railroad generator.

D. D. Lamond & Co., consulting and contracting engineers for blast furnace construction, Ferguson Building, Pittsburgh, Pa., state that of late they are receiving more inquiries than for a long time previously. Naturally, the inference is drawn that trade conditions are not only better than they have been but are still improving.

The Elkins Foundry & Machine Company, Elkins, W. Va., is erecting a new plant, which will include a machine shop, 32 x 60 ft., a foundry of the same size and a pattern storage room on the second floor. C. S. Robb is president of the company and J. P. Phillips is manager.

The Bessemer Gas Engine Company, Grove City, Pa., has received an order from the Honolulu Gas Company, Honolulu, for a 60-hp. gas-engine-driven compressor and has also received several orders for compressors to be used in the West Virginia gas district.

The Art Brass Fixture & Mfg. Company, Pittsburgh, has put in operation at McKees Rocks its new plant for the manufacture of steel and brass stampings, turnings and fixtures, a complete line of combination gas and electric fixtures, art brass specialities, steel, aluminum and enameled sheets, etc. Lawrence M. Fluhart is president; Scott Hayes, vice-president; Livingston R. Jeffords, treasurer; John A. Irwin, secretary; Carroll P. Davis, counsel, and Earl B. Hennecke, general sales manager.

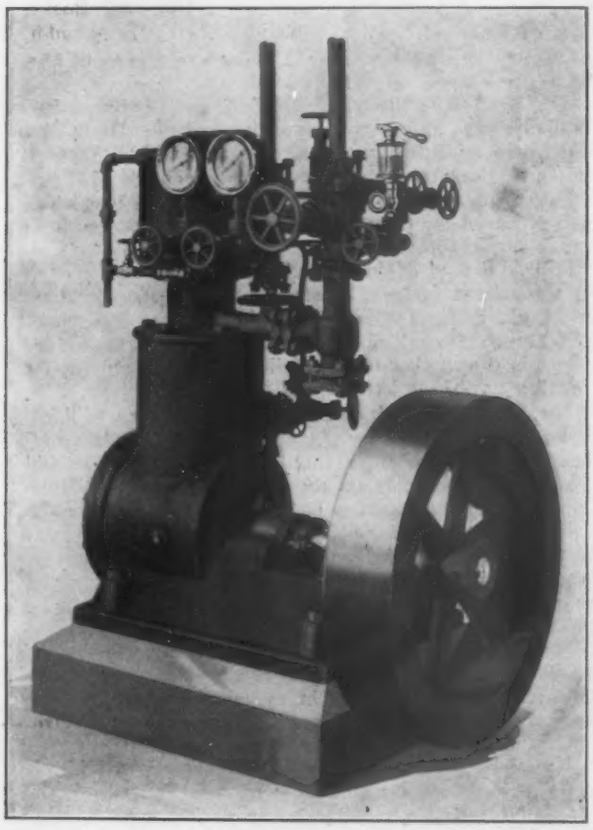
A cylinder with two pistons describes a feature of a steam engine built by Kühnle, Kopp & Kausch, Frankenthal, Bavaria. Its aim is to reduce to a minimum the variations in temperature of the metallic walls of the cylinder with which the steam comes in contact. The admission of steam to the cylinder takes place at a middle point, it being delivered behind one piston while the other is compressing so that the latter may be ready to receive the high pressure steam at the end of the stroke of the acting system, the two systems of course being fixed to a single rod and moving together. Each piston is single acting, alternately receiving the supply of live steam.

The Mumford Molding Machine Company, Plainfield, N. J., reports that among orders received in August for large jolt ramming machines were the machines for the new foundry of the Pennsylvania General Electric Company, at Erie, Pa.; a 24-in. machine with table 72 x 72 in. for the Burnside Works of the American Brake Shoe Company; a third machine for the Snow Steam Pump Works, Buffalo, N. Y., and a machine with table 72 x 108 in. for the Moore & White Company, Philadelphia.

The Vilter Ammonia Compressor

Regularity of operation, reliability and efficiency coupled with a low initial cost are the special features claimed by the Vilter Mfg. Company, 1008 Clinton street, Milwaukee, Wis., for its new vertical single-acting air compressor. In designing the machine an effort was made to secure one that would be nearly as automatic as possible in operation and free from a multiplicity of parts and many operations.

The entire base, two main crank shaft bearings, the cylindrical crank shaft and the compressor support are an integral and substantial casting. The cover for the crank case has the same diameter as the part upon which it rests, thus assuring ready accessibility to the crank pin and the connecting rod. The crank shaft journals, two in number, are of ample proportions and are located in perfect alignment. Removable white metal bushings are employed to insure smooth running and maximum service. The compressor, the water jacket and the members connecting the suction and the discharge pipes also form a single semi-steel casting. The suction enters the cylinder at a point near the center of the bore in the vicinity of the supporting flange and meets the long ports of the double trunk piston. At the top the cylinder is counterbored to receive



The New Improved Vertical Single-Acting Ammonia Compressor Built by the Vilter Mfg. Company, Milwaukee, Wis.

the discharge valve and cage. The cylinder head is a simple round casting held in position by heavy studs and nuts and can be removed without disturbing any pipe connections or mechanical parts. The base and the compressor are bolted together and when this is done the non-moving structure of the machine is complete.

A double trunk piston having long ports between the upper and lower fitted sections is used. These ports register with the suction gas inlet throughout the entire stroke, thus securing ample passage for gas to the compression end of the cylinder, but at the same time preventing liquid or gas from entering the crankcase. The upper part of the piston, which contains the large suction valve, has two right-angle cut concentric snap rings, while similar rings are fitted above and below the hollow piston pin in the lower part. Steel set screws keep the piston pins in the bosses and an even distribution of oil to the cylinder walls is secured by the use of oil grooves. High grade forged steel is used for the suction valve which is contained in the piston. This valve is carefully finished and ground to a perfect seat, all superfluous metal being removed from the disk and the stem drilled throughout the entire length to decrease the weight and render the valve responsive in operation. The discharge valve which is housed in a semi-steel cage fitted into the upper counterbore of the cylinder is a light-weight cup-shaped piece of pressed steel. In proportion to their size both valves are said to be very light in weight and of ample proportion with relation to the bore of the cylinder. These valves will give the full area opening at from ⅛ to ¼ in. extreme lift, thus insuring full cylinder charging and noiseless operation at all speeds.

The connecting rod, which is made in two parts, has a solid round head steel forging for the upper portion. The piston pin eye is bushed with white metal which is carefully finished to fit the pin while the crank pin end is a separate marine type journal, lined with high grade babbitt metal. The two parts of the rod are fitted to screw together to provide the necessary adjustment for the piston clearance and are rigidly locked by a steel jam nut. A simple straight round steel forging finished throughout its entire length is used for the crank shaft, a solid crank being pressed and keyed on one end and a band wheel applied to the other.

The lubricating system includes a hand oil pump to furnish oil to the upper part of the cylinder and an oil cup or grease box for the main bearing adjacent to the fly-wheel. Oil is splashed from the crank case to lubricate the inner main bearing, the crank and piston pins and the lower part of the trunk piston automatically and it is only necessary to introduce an additional supply of lubricant through the plugged opening at the upper part of the crank case cover occasionally. The hight of the oil in the crank case is indicated by a gauge glass.

The Heald Machine Company's Good Business

The Heald Machine Company, manufacturer of grinding machines, Worcester, Mass., is building an addition which will enable the doubling and probably trebling of its product, should this become necessary. In erecting the new shop, the endeavor has been to construct a model building which will be the most satisfactory possible for the work to be done in it. It is constructed of reinforced concrete, with brick panels under the windows and saw-tooth roof, and is arranged with concrete posts and concrete girders for five rows of cranes for use in assembling machines. The principal purpose is to use this building as an assembling shop, thus relieving the congested condition of the present works, in which for some time there has not been sufficient room for conducting this essential part of manufacturing operations.

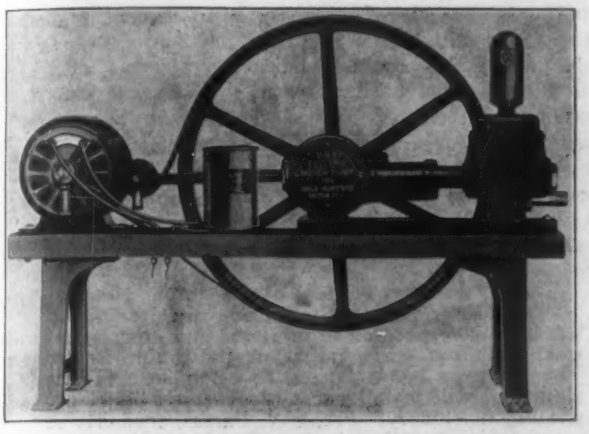
The company has several new machines under construction and in process of working up. One of these machines recently brought out, the No. 75 internal grinder, is a modification of the company's standard machine, the principal changes being to adapt it especially for grinding short holes such as will be found in ball bearings, transmission gears and various sleeves and bushings not over 2 to 3 in. long. The company has been favored with an excellent amount of business, its sales for the past twelve-month having amounted to 80 per cent. of those of the preceding twelve-month, which was the biggest year's business it has ever done.

A compendium on core-room practice is what E. A. Coleman's paper on the subject is, presented at the Pittsburgh meeting of the American Foundrymen's Association. The paper has now been printed, and its enumeration of the design and equipment of the core-making and core-baking departments of the foundry, illustrated with 38 large-size half-tone engravings of modern machinery and arrangement, makes it of great value. It is possible that copies may be had for a nominal sum by addressing Dr. Richard Moldenke, secretary of the association, Watchung, N. J.

The T-slots in small tables for machine tools are frequently milled out on vertical spindle milling machines. Difficulty is encountered in removing the cutting, and the speed of machining has been held down as a result. In this connection the use of a small jet of compressed air playing continuously on the work at the point of cutting has been found to increase the operating speed fully 50 per cent.

Motor-Driven House Pump

To provide an independent and reliable automatic water supply system for all purposes the Vaile-Kimes Company, Dayton, Ohio, is manufacturing an electric motor-driven pump designed for installation with a compression or pneumatic tank. Although the rural and suburban districts are regarded as the principal fields of usefulness for which the pump was intended, it can nevertheless be used in cities where the water rates are high and one's



A Pump with Westinghouse Motor Drive Built by the Vaile-Kimes Company, Dayton, Ohio.

own supply is available or where the pressure is low. A supply of electricity is, course, necessary.

The pump takes the water directly from the cistern, well, lake or stream and forces it under pressure into a tank from which it is distributed to the house. The power is obtained from a ⅓-hp. Westinghouse motor and one of the special features of the outfit is the use of a large flywheel and an idler. The first cost of the outfit is comparatively small, it is explained, when the capacity and efficient operation are taken into consideration and the operating expense is also very slight.

An automatic switch governed by the water pressure in the system controls the operation of the motor, starting it automatically when the pressure falls to a given point and stopping it when the maximum desired pressure is reached. No attention is therefore required to keep the water supply up to the desired point. A smooth and uniform discharge is secured by the air chamber.

The following table gives the principal dimensions and specifications of the pump.

Diameter of cylinder, in.	1¼
Length of stroke, in.	2
Diameter of suction pipe, in.	¾
Diameter of discharge pipe, in.	½
Diameter of pulley, in.	20
Speed of pulley, r. p. m.	140
Pressure developed, lb.	35
Capacity of pump per hour, gal.	180
Overall length, in.	33
Overall width, in.	10
Overall height, in.	20
Complete shipping weight, lb.	90

If desired the pump can be arranged to be mounted on the wall by substituting brackets for the legs.

The Electric Lamp Trade

The National Electric Lamp Association, Cleveland, Ohio, states that the various member companies of that organization are adding to their office space in the principal cities as rapidly as the growth of their business warrants. The past month one of the companies opened new offices in San Francisco and Los Angeles. Two other companies have erected new office buildings for their own use. The manufacturing and engineering facilities are increasing correspondingly.

The development laboratories of the association have for several months been working on a number of new types of lamps. These new types include the round bulb Mazda lamp for regular residence service in a smaller bulb than has up to a recent period been available, this bulb being only 2 5/16 in. in diameter; a tubular bulb Mazda lamp, which is the first of that kind ever placed on the market, and a line of Mazda lamps specially designed for electric vehicle service. The tubular lamp, which is supplied in the 25-watt size is a bulb 1¼ in. in diameter and 5¾ in. in length, will probably be of the most interest for industrial work, as a bulb of this shape adapts itself to many special uses in connection with the illumination of machine parts where a restricted space is available for the lamp.

From present indications, the total number of lamps sold by the member companies of the association this year wil be considerably in excess of the number sold last year, and this may be taken as an indication of a healthy condition of the industry.

Duff Ball-Bearing Journal Jack

For the rapid and convenient removal or replacement of journal brasses in freight cars, passenger and Pullman coaches and for general railroad service where short, light and powerful jacks are required, the Duff Mfg. Company, Pittsburgh, N. S., Pa., has recently placed on the market an improved ball-bearing pack. The special features of the jack are a positive stop to prevent the lifting bar from being run too far out of the jack, an adjustable wheel holding device and ease of operation.

The load is raised on an improved type of ball-bearing on the downward movement of the operating lever which is the more convenient stroke. The material and workmanship are high grade throughout. Refined malleable iron and steel are employed and all the gears are steel forgings with machine cut teeth. The weight of the jack is very light, being only about 35 lb., and a convenient carrying handle at the right enables the jack to be transported from place to place easily. An adjustable wheel

The No. 53 Improved Ball Bearing Journal Jack Built by the Duff Mfg. Company, N. S., Pittsburgh, Pa.

holding device of improved design shown at the left is provided to hold the wheel down when operating. This is a very essential feature under many conditions, but if not required it can be readily detached from the jack by loosening the top and the bottom holding bolts.

The jacks are made in two sizes of practically the same construction, the only difference being in the height and the length of the raise. Both jacks have the same capacity, namely, 15 tons. The closed hight of the No. 53 jack, which is the one illustrated, is 9¾ in., the length of raise, 4 in., and the weight 35 lb. The other jack which is designated as the No. 52 type measures 11 in. when closed, has a 1-in. longer raise and weighs 2 lb. more.

David Evans & Co., Rookery Building, Chicago, have acquired the exclusive Western representation for the Columbia Steel Company, Elyria, Ohio, in northern Indiana, western Michigan, Illinois, Wisconsin, Iowa and Minnesota. In this connection H. L. Hanson has become associated with David Evans & Co. and will give his entire attention to the development of the line of cold-rolled strips and sheets for stamping, drawing and forming.

The Machinery Markets

Orders are not very well distributed in the machinery trade. Some branches of manufacture are doing an excellent business, while in others a lamentable dullness prevails. Some good export trade has been placed in New York and inquiries from that source are heavy. The call for machinery for export is noticeably good in most markets. In Cincinnati, for instance, the importance of the export trade is shown by the books of one manufacturer, which indicate that 65 per cent of his recent orders have come from abroad. In Cleveland no improvement has been noticed in the recent demand. Business is slightly better in St. Louis, but is scarcely 65 per cent of normal there. In Chicago, as elsewhere, there is an absence of lists from the railroads, but a fairly good miscellaneous trade is coming out. Inquiries and orders show a slight increase in Detroit, the campaign for good roads causing the purchase of considerable road working machinery. The trade in New England is expecting some good business from the General Electric Company for its Lynn works; no list is out, but the company is believed to be preparing to buy about $100,000 worth of equipment. Mining and irrigating enterprises are developing some business in Texas where a general improvement is seen in the demand from manufacturing plants. Automobile repair shops and other small consumers of tools are placing good orders on the Pacific coast, where mining and saw mill requirements are also in active demand. A disappointing lull exists in the South in the demand for general machinery, but makers of machinery for breweries and distilleries report a heavy influx of orders.

New York

NEW YORK, September 13, 1911.

Considerable good business is coming to general machinery houses, but the orders are for small lots of tools, with the exception of those from export houses. The export trade continues to excellently support the market. The recent buying here on the part of Japanese engineering firms, it has been ascertained, was for the account of the Imperial Steel Works, which is adding to its metal-working equipment. A large list of machine tools has been sent to manufacturers by Fox Brothers & Co., 126 Lafayette street, New York. This equipment is intended for a South American customer whose name is not disclosed. Some South American inquiries that have appeared in this market of late were for machinery for a shipyard in Argentina. The railroads are buying a machine here and there. The New York Central has been closing for some small lots of equipment and it is believed to be buying very conservatively against a large list sent out several months ago. The Westinghouse Electric & Mfg. Company, Newark, N. J., is getting some machine tools to be installed in an addition now under way. Several orders were placed for machinery through New York representatives of Western machine tool builders for machines for delivery to Newark, but they were purchased through the Pittsburgh office of the company. On other occasions the Newark plant has filled its machinery wants direct. Recent dullness in the real estate markets in cities adjacent to New York has resulted in a decrease in the applications for building permits, and manufacturers of power units, such as are installed in office buildings and factory lofts are feeling the lack of business from that source. There is also a decided absence of new enterprises in the way of factory construction.

The United States Government has been purchasing considerable power equipment lately, and air compressor manufacturers have been getting some excellent business from that source. The Isthmian Canal Commission is now taking bids for the equipment for a hydroelectric station to be erected at Gatun on the Canal Zone. The plant is to have an original capacity of 6000 kw. divided into three units of 2000 kw. each. In addition there are to be installed two 100-kw. motor generator exciter sets for the regulation and control of the turbo alternators. The generating room is to be served by a 20-ton crane, and there will be compressed air regulators.

Inquiries for material for medium-sized power plants for lighting systems are coming out well just now. The municipal lighting plant of Freeport, L. I., is to be improved at an expenditure of $10,000. The municipality of Bismark, N. J., is getting bids on equipment for a small lighting plant, and a boulevard lighting system is to be installed at Binghamton, N. Y. The Keeseville Electric Company, with offices at Jay, N. Y., has been granted permission to build an electric light plant and a transmission line 15 miles from Ausable, N. Y., to furnish power to nearby towns.

The Hanson & Van Winkle Company, 329-331 Chestnut street, Newark, N. J., manufacturer of electroplating apparatus, etc., is making an addition 30 x 50 ft., and three stories to its plant.

The Royal Gem Knitting Mills Company, St. Johnsville, N. Y., is erecting a new plant, 48 x 224 ft., at an expenditure of $18,000.

The Farrar Iron & Steel Company, Buffalo, N. Y., has been incorporated to fabricate and erect structural steel buildings. Its initial capitalization is $10,000. The company has arranged to establish a fabricating plant and will install necessary cutting, punching and riveting machinery. Frank N. Farrar, formerly secretary of the East Buffalo Iron Works and president of the Builders' Association Exchange, is president and treasurer of the new company. James Thompson, a prominent structural steel erector, is vice-president, and Edward J. Henesey, formerly with the H. C. Harrower Iron & Steel Company, is secretary. Offices have been opened in the Builders' Exchange.

Work will soon be commenced on addition, 80 x 200 ft., one story, of steel and reinforced concrete, which is to be made to the boiler shops of the Utica Steam Engine & Boiler Works, Utica, N. Y.

The E. J. Bosworth Specialty Company, Rochester, N. Y., has been incorporated with a capital stock of $30,000 to manufacture metal and leather specialties. E. J. Bosworth, C. W. Ryan and G. P. Culp, 12 Beverly street, are the incorporators.

The Niagara Chocolate Company, Niagara Falls, N. Y., has completed arrangements for building a factory on Erie avenue, in that city.

The Camillus Cutlery Company, Camillus, N. Y., is taking bids for a drop-forge shop, 50 x 100 ft., one story, which it will erect this fall.

The Syracuse Unit Brick Company, Syracuse, N. Y., has been incorporated by W. P. Hart and J. D. Meehan, of Syracuse, and C. F. Lane, of Detroit, Mich., to manufacture brick, tile, etc. The capital stock of the company is $240,000.

Contract for construction of powerhouse and pumping station and foundation for engines for the water works at Silver Springs, N. Y., has been awarded to Wm. Summerhays & Sons, Rochester, N. Y.

The Eureka Seat Company, Buffalo, N. Y., has been incorporated to manufacture automobile seats and parts. The capital stock is $10,000. The incorporators are Joseph H. Morgan, 217 Laurel street; Maurice J. Cogan and Norbert C. Kropp.

The Pratt Chuck Company, Frankfort, N. Y., has let contract for the erection of a factory building 80 x 260 ft., one story.

The Trojan Shirt Marker Company, Troy, N. Y., has been incorporated by H. I. Gasson, 64 Maple avenue, Troy; Walter G. Lichtenstein, Rochester, and Victor E. Nathan, New York City, to manufacture shirt markers, etc. The company has a capital stock of $50,000.

The Fancher Furniture Company, of which J. Walrath is president, Salamanca, N. Y., has let contract for the erection of a four-story furniture factory, 60 x 150 ft., on Rochester street.

The Thorold Silver Smelter Company, Thorold, Ont., which is the largest silver smelter in Canada, and treats the concentrates of many cobalt mines, will move its plant from Thorold to Niagara Falls, N. Y., where it will build and equip a plant which will enable it to double its output. By this change in location the company will secure exemption from the duty of 2½ cents per pound on cobalt going into the United States and also a better labor market. The company annually ships $500,000 worth of its product to the United States.

The Clark Harp Mfg. Company, Syracuse, N. Y., has been incorporated with a capital stock of $100,000

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to manufacture harps and other musical instruments. M. A. and M. E. Clark and V. R. Clymer, Syracuse, are the incorporators.

The town of Hobart, N. Y., will build a sewage disposal plant, a water filter system and a water storage reservoir from plans of Morrell Vrooman, engineer, Gloversville, N. Y.

The Solvay Steel & Forging Company, recently incorporated at Solvay, N. Y., a suburb of Syracuse, has secured a site and commenced the construction of a small plant, with which it will do a general forging business. Charles M. Hammond is president, Henry W. Thomsen is vice-president, and Otto Schramm is secretary and treasurer.

Work is progressing rapidly on the extensive addition which the Swansdown Knitting Company is building to its plant at Hudson, N. Y.

New England

BOSTON, MASS., September 12, 1911.

The trade is chiefly interested in inquiries from the General Electric Company for a large amount of machine tools for the Lynn Works. From known items in the list it is believed that the total of purchases will run well above $100,,000. No general list has been sent out, so far as can be learned by the trade, purchases being made with some degree of previous selection.

Business has not improved. The usual experience is that September is not beginning well. Some of the builders of machinery report conditions satisfactory. Among these is the Bullard Machine Tool Company, Bridgeport, Conn., which reports a satisfactory amount of orders for vertical lathes and boring mills received from widely diversified industries. The export trade plays an important part with most of the builders of lighter machinery who are at all busy. Experiences vary greatly in the various branches of the metal trades.

The Judson Tool Company, Auburn, Me., has established a shop on Washington street, where it will manufacture a lathe tool holder, a lathe taper attachment, a lathe center grinder and a steam and air regulator, as well as doing a general jobbing business. The company has $10,000 capital. Willard J. Stevens, South Poland, Me., is the president; Perley E. Fish, Auburn, treasurer, while the third director is Harry Mansur, Auburn. The shop has received its equipment and nothing more will be purchased at present.

The Howe Scale Company, Rutland, Vt., is erecting a foundry building, 64 x 64 ft., of wood and concrete, the capacity of the present being no longer adequate to the company's needs.

The American Steel & Wire Company is erecting a storage at its Worcester, Mass, works, 100 x 160 ft., one story, of brick, concrete and steel construction.

The Penobscot Machine Company, Bangor, Me., founder and machinist, is building a foundry and machine shop to replace the building destroyed by the conflagration of April 30. The foundry and blacksmith shop are nearly completed, and the work of the machine shop building, which will be 46 x 68 ft., four stories, will begin immediately. The company has purchased all the equipment that will be required at present.

The Wright Wire Company, Worcester, Mass., is adding two stories to a brick building, 42 x 176 ft., at its Palmer, Mass., plant. The entire building will be used for wire drawing, part of the machinery being taken from the Worcester mills, and part being under construction at the company's machine shop. The machinery in the present building will be removed to a new structure which was completed recently.

The F. E. Wells & Son Company, Greenfield, Mass., will erect a new building at Turners Falls, Mass., which will be devoted to a new forging department in which wrench forgings will be manufactured, largely for the company's own product.

The Bontempi Rust-Proofing Company, 111 Broadway, New York, has leased the building at Water and Thomas streets, Bridgeport, Conn., and will equip the premises for the treatment of iron and steel products for the prevention of rust.

The H. E. Chellis Company, 65 Harrison avenue, Springfield, Mass., manufacturer of screw machine products, has been incorporated with a Massachusetts charter, to take over the business started by H. E. Chellis last February. Mr. Chellis is the president, Thomas H. Baldwin, treasurer, and Robert A. Baldwin the third director. The business has grown so rapidly that it was necessary to secure new capital. The shop is now running four nights a week until 10 o'clock.

The McLagon Foundry Company's plant at New Haven, Conn., was burned September 8, with a loss of $5,000. The machinery and patterns were destroyed.

B. F. Perkins & Sons, Holyoke, Mass., will erect a one-story addition, 100 x 200 ft., one story.

The Shoe Hardware Company, Waterbury, Conn., will largely increase its plant by the addition of two buildings, one 86 x 96 ft., five stories, the other 33 x 43 ft.

The Connecticut Company will build an addition 60 x 60 ft., to its power plant on Grand avenue, New Haven, Conn.

Additions to general manufacturing plants in New England include the following: Hoosac Cotton Mills, North Adams, Mass., additions to cost $800,000, including, according to local report, weave shed 180 x 280 ft., three stories; spinning mill, 155 x 382 ft., and boiler house to contain 13 50-hp. boilers, seven of which will be installed immediately. Fellows & Co., Boston, addition, 40 x 80 ft., three stories, to novelty wood working plant, Skownegan, Me.

Philadelphia

PHILADELPHIA, September 12, 1911.

Business continues to drag. Purchases are deferred as long as possible, and, when finally made, immediate delivery is required. Transactions are almost entirely confined to single tools. Occasionally a sale of a few tools for small shop equipment is reported, but even business of this character is scarce. Merchants' sales for the week have been small, and tool builders report a scattered business, the bulk of the trade coming from points outside this territory. Locomotive builders are not so fully engaged and car builders report less active conditions. A fair amount of business has been done in special machinery equipment. The demand for boilers and engines continues moderate, the bulk of the business being confined to equipment of the smaller class. General inquiries for machinery are light and, under existing conditions in the industrial trade, there is little prospect for any immediate material increase. The foundry trade still continues irregular.

Ballinger & Perrot, engineers and contractors, are taking bids for a brick and concrete addition, 60 x 98 ft., five stories, to the manufacturing building of Laird, Shober & Co., Nineteenth and Buttonwood streets. Electric lighting and steam heating are included. The matter of increasing and rearranging the power plant of the company is being considered.

The Elwood Ivins Tube Works, Oak Lane, notes a steady improvement in the demand for its various lines of seamless tubing. The plant is running full time, as has been the case for several years. New machinery is being added to the equipment, the majority of which is of a special nature peculiar to the class of work.

The Royersford Foundry & Machine Company, Royersford, Pa., still reports an unsatisfactory demand for its lines of punches and shears. In its other specialities, such as power transmission, machinery, roller bearing, hangers, etc., a fair business has been done.

The R. S. Newbold & Son Company, Norristown, Pa., reports orders for last month as being fully up to those received in June and July. A number of good contracts have been closed, and orders on hand are sufficient to keep the plant fully occupied for the next three months.

The Department of Supplies, city of Philadelphia, will receive bids until September 15 for various supplies required for the year 1912. These include, among other articles, electric supplies and instruments, oils, greases and boiler compound, paints, varnishes and painters' supplies, bicycles and bicycle sundries. Samples may be seen and specifications obtained on application to the director, Joseph H. Klemmer, 312 City Hall.

It is reported that the John B. Stetson Company, hat manufacturer, has purchased the plant of Isaac A. Sheppard & Co., stove manufacturers, covering a city block at Third and Fourth streets, Montgomery avenue and Berks street, and will erect several large manufacturing buildings. The parties interested refuse either to confirm or deny the report, but the general belief is that the deal has been consummated and that Sheppard & Co. will move their plant to a new location.

The Philadelphia Roll & Machine Company is operating its plant on full time, but not quite up to full capacity, although closely approaching that mark in the roll department. Orders for its new type of chilled cast rolls have been quite numerous, while a good pro-

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portion of business has been done in sand cast rolls. The demand for charcoal iron machinery castings has not been particularly active, although a number of orders for special machinery equipment have been taken.

The Energy Elevator Company continues exceedingly busy. Orders from out of the city have been particularly heavy, although local orders have also been satisfactory. A number of power freight elevators are being installed locally and in various sections of the country, including one in Paterson and another in Perth Amboy, N. J. Automobile lifts are also in good demand. It is contemplating the purchase of additional machine tool equipment.

The stockholders of the old Baldwin Locomotive Works will hold a special meeting September 21 for the purpose of formally transferring its real and personal property to the new corporation. This will conclude the various details in connection with the recent changes of title and corporate arrangements. Officials of the company state that business recently has been quiet, orders having been coming in in small number from railroads and industrial concerns, and there is little ahead in the way of large business. About 12,000 employees are now on the pay roll. The labor difficulties which this company has been experiencing are entirely a thing of the past.

Frank Toomey, Inc., dealer in machinery and supplies of every description, 127-131 North Third street, Philadelphia, has under way some additions to his warehouse which will not be completed until about the beginning of next year. He expects soon to put on the market about $100,000 worth of some of the most modern machine tools.

Chicago

CHICAGO, ILL., September 12, 1911.

The absence of any machinery lists from railroads or the large buyers has created an atmosphere of dullness in the local market, which has not been scattered by the fairly good miscellaneous business prevailing. A local machinery dealer furnished the complete equipment for a newly equipped drop forging plant and several sales of machines in lots of two or three are reported. Floor sales have made up the greater part of the local business in the past week and shipments have been to widely separated points.

Fritz A. Schultz, builder of metal spinning lathes and other sheet metal working tools, will move from his present location on North Jefferson street, Chicago, to 4824 West Lake street. At this latter location, two buildings, one 50 x 125 ft. and one 30 x 40 ft. will be occupied. Additional machinery and equipment will be required.

The Alamo Engine & Supply Company, Omaha. Neb., has obtained the contract for the installation of the new water works plant at Benedict, Neb.

The Kessler-DuMez Machinery Company, Milwaukee, incorporated by E. S. Kessler, A. Henry DuMez, and Wilhelmina DuMez, will have a capital stock of $25,000.

The Stahl-Slater Lubricating Company, St. Paul, Minn., is about to erect a $20,000 steel and concrete factory building on property recently purchased. It is expected that the building will be ready for occupancy this fall.

The Progress Machine Company, Chicago, has entered into a lease contract for a term of 20 years, covering the occupancy of a factory building to be erected at 512 La Salle avenue. Construction is to begin at once.

Elmer L. Jensen, engineer, Harvard, Neb., will receive bids until September 22 for the construction and installing of an electric light and water works plant for the town of Grafton, Neb.

The Manistee Iron Works, Manistee, Mich., expects to manufacture, under exclusive American and Canadian rights, a new type of rotary pump. It is planned to increase the capital stock of the company to provide for the development of this new line.

The Peoples Power Company, East Moline, Ill., will install in the course of the next six months a generator and transformer station at the location recently acquired on First avenue.

The Webster Mfg. Company, Tiffin, Ohio, manufacturer of transmission machinery, have opened a sales office in Chicago, at 816 Fisher Building.

The Mayo Mfg. Company, Chicago, has been incorporated with a capital stock of $6000 for the manufacture of wagons and vehicles. Incorporators are Franklin Mayo, Walter N. Jacobsen, and Edward D. Chaurette.

The Joliet Auto Truck Company, Joilet, Ill., to manufacture and deal in vehicles, supplies and accessories, has been incorporated with a capital stock of $10,000. Incorporators are Philip F. Carroll, Milo M. Case, and Wilbur O. Dayton.

The Buchanan-Daley Company, Joilet, Ill., has been incorporated with a capital stock of $40,000, and will deal in lumber, coal, and building materials. Incorporators are William M. Buchanan, Edward R. Daley, and Lester Patterson.

The Western Aeroplane Mfg. Company, Chicago, to manufacture aeroplanes, has been incorporated with a capital stock of $1200, by Adolph Katz, Jay J. Douglass, and Charles T. Bushong.

The Advance Water Heater Company, Chicago, which has recently been incorporated with a capital stock of $10,000, will manufacture and deal in heaters, iron and lead pipe. The incorporators are P. A. Thompson, C. T. Temple and W. H. Gilbert.

The Lowrie Safe & Lock Mfg. Company, Chicago, to manufacture safes and locks, has been incorporated by George L. Walker, William J. Walker, and J. Hubert Jann. Capital stock, $1000.

The Borden Condensed Milk Company will erect a $40,000 addition to its Elgin, Ill., plant, the structure to be 60 x 120 ft. Reinforced concrete construction will be used.

The Federal Engineering Company, Milwaukee, is having plans prepared for the erection of a factory building 60 x 100 ft., at Scott street and Thirty-sixth avenue.

The National Machine Company, Milwaukee, is erecting a new shop on National avenue.

The Oklahoma Engineering Company, Oklahoma City, Okla., has been incorporated with a capital stock of $25,000. Incorporators are Fred W. Kenney of Anadarko and George W. Frye and T. Myron Pyle of Oklahoma City.

The citizens of Grove, Okla., have voted for the construction of an electric light plant and water works.

Bonds amounting to $170,000 will be issued for municipal improvements at Hobart, Okla.

Cincinnati

CINCINNATI, OHIO, September 12, 1911.

There is some complaint among machine tool builders regarding the slowness of collections, but this condition is expected to improve as the fall season advances. Inquiries continue very encouraging, as compared with two months ago, and, while the railroads are practically doing no buying at all, business from the general trade is coming up well. The importance of the export trade is emphasized in the statement of one large manufacturer, whose books show that 65 per cent. of his orders now come from that source.

Woodworking machinery is in excellent demand, with the South furnishing a full share of business in that line.

As was mentioned some time ago, the J. A. Fay & Eagan Company, Cincinnati, manufacturer of woodworking machinery, has acquired a large building site in Bond Hill suburb, to which its city plant will be moved as soon as the necessary buildings are constructed. As the Cincinnati Traction Company has agreed to construct a car line to this suburb, it is quite probable that building plans for the new factory will be rushed and construction started at an early date.

B. L. Baldwin & Co., Perin Building, Cincinnati, are working on plans for a four-story factory building to be constructed for the United States Paper Goods Company, on Pearl street.

To mine coal and manufacture coke, the Union Coal Land Company has been incorporated at Logan, W. Va., with a $75,000 capital stock. Among the incorporators named are: J. Carey Alderson, S. A. Draper and E. G. England, all of Logan.

It is rumored that the O. Armleder Company, Cincinnati, manufacturer of light auto trucks, is contemplating an addition to its plant, or the erection of a larger new factory on another site.

The Triumph Electric Company, Oakley, Cincinnati, has decided to enlarge its plant. No plans have as yet been made up, and definite information as to the size of the addition will hardly be available before next spring.

The Cincinnati Lithographing Company has had

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E. Sloctemeyer, architect, draw up plans for a two-story building, 90 x 100 ft., and of steel construction, to be erected at Findlay and Province streets.

The Alma Cement Company, Jackson, Ohio, has increased its capital stock to $1,000,000. It has not been announced whether this increase means any additions to its present plant.

The Cincinnati Traction Company has let contract to the Roche-Bruner Company, Johnston Building, Cincinnati, for the construction of the large car barns in Hyde Park, recently mentioned.

It is reported that the Cincinnati Fly Screen Company will soon enlarge its plant in the West End district.

Considerable power plant and heating equipment will be required for the new Good Samaritan Hospital, to be erected in Cincinnati. Gustav W. Drach is the architect in charge.

The Fork Mountain Lumber Company, Springdale, W. Va., has been incorporated with $50,000 capital stock to operate a sawmill. Jacob S. Young, Springdale, is one of the incorporators.

Kirk & Blum, sheet metal workers, Cincinnati, have recently closed contract for the installation of a large dust and shavings collecting system for the Champion Works of the International Harvester Company, at Columbus, Ohio.

Fahnestock, Ferber & Robertson, Cincinnati architects, have drawn up plans for rebuilding the garbage reduction plant of Covington, Ky., recently destroyed by fire.

The William Powell Company, Cincinnati, will make an addition to its plant by the construction of a basement and remodeling the first floor of its factory.

The United States Electrical Tool Company, manufacturer of portable electric tools, Cincinnati, completed a new factory building this year, 68 x 200 ft., two stories, of brick construction. The company reports that business has picked up well in the past few weeks and promises to be considerably better than during the summer months. Some new tools are shortly to be brought out by the company.

The machine tool business is increasing with manufacturers at Hamilton, Ohio. The president of a large metal working machinery manufacturing company there recently stated that for the first time in three years the company has been receiving good inquiries from its agents in European countries, outside of Germany and Russia. All of the company's European representatives report that business in their territory is improving.

Cleveland

CLEVELAND, OHIO, September 12, 1911.

The local machine tool market continues dull, September having apparently brought out no improvement in the demand. The only business placed with the dealers the past week was scattering orders for single tools. No inquiries of any consequence came out. The only business of importance pending is the machinery equipment for the new West Technical High School, orders for which are expected to be placed this week. The demand for second-hand machinery is inactive. Builders of machine tools and general machinery report conditions about stationary. However, when any change is reported it is slightly for the better. The foreign demand is generally quiet, not being more active than the domestic demand. Orders for forging machinery are slightly more plentiful. The demand for automatic screw machinery is not active. Makers of industrial car and locomotive equipment report a moderate volume of orders. Makers of twist drills are getting a better volume of orders, and the demand for screw machine products has picked up. Automobile plants are quite busy, but they appear to have finished the placing of orders for their machinery requirements for the season, orders from that source being very light. The railroads are still keeping out of the market.

The Ajax Mfg. Company, Cleveland, has recently received orders for two large forging machines, one a 6-in. machine for the Milwaukee plant of the International Harvester Company, and the other a 5-in. machine for the shops of the Kansas City Railroad at Pittsburgh, Kansas.

Proposals will be received by F. A. Jones, consulting engineer, Youngstown, Ohio, September 28 for a gas engine, generator and motor for the new high school building in that city.

The Hobbs-McCarty Company, Cleveland, has been incorporated, with a capital stock of $25,000, by F. B. Hobbs, W. F. McCarty and others. The company will operate a plant at 10011 Quincy avenue, Cleveland, now run in the name of F. B. Hobbs, and another plant in Medina, Ohio. It will make tools, dies and special machinery.

Several Canton men, headed by L. E. Shull, formerly president of the Shull Steel Casting Company, have prepared a proposition for the establishment of a large foundry in Coshocton, Ohio, for the manufacture of radiators. The matter will be taken up by the Board of Trade in Coshocton.

Ground will be broken shortly for the new plant of the Ohio Steel & Wire Company, Warren, Ohio. It will be located near the plant of the General Foundry Company in that city.

The Buckeye Stereopticon Company, Cleveland, has increased its capital stock from $50,000 to $75,000.

The Novelty Stamping Company has accepted the offer of a new site at Shadyside, Ohio, near Bellaire, for the erection of a new plant. The company plans to start work shortly on the plant, which will be used for the manufacture of enamel ware.

The Toledo & Ohio Central Railroad has under consideration the extension of its shops at Bucyrus, Ohio.

Detroit

DETROIT, MICH., September 12, 1911.

A slight betterment is observed in conditions in the local machinery market, some orders of small lots being reported, together with a number of single tool propositions. Inquiries show an increase and dealers generally are rather inclined to be optimistic over the outlook. The campaign for good roads in the State has caused the purchase of quite an amount of roadmaking machinery, and a good deal of second-hand equipment is being used in this connection.

The Michigan State Fair will be held in Detroit, September 18 to 27, and Detroit manufacturers will have an exceptionally complete exhibit of machinery and implements.

Building circles have been rather quiet, the awards for the week being of a very ordinary nature.

A deal of considerable importance was consummated this week through the purchase by the Crane Company, Chicago, of a site for a branch plant in this city. The company, which is one of the largest manufacturers of valves, pipe and fittings in the country, has acquired the plant and business of the J. A. Roe Company, Detroit, and a piece of land 105 x 480 ft., adjoining on the river front, on which the new buildings will be erected.

Figures have been asked on a large new mill building for the Commercial Milling Company. Modern milling machinery will be installed.

The Public Lighting Commission is erecting an addition to the municipal electric light plant. Smith, Hinchman & Grylls are the architects.

The Wolverine Hotel Company has been incorporated with a capital stock of $416,000. The company has plans in the hands of Spier, Rohns & Gehrke, architects, for the construction of a 14-story hotel. A large amount of structural steel will be used and a heating plant and elevators installed.

Malcolmson & Higginbotham are preparing plans for the new Northwestern High School. The building will be 168 x 241 ft., with a separate boiler house.

The Herreshoff Motor Car Company has purchased a tract, comprising approximately 50,000 sq. ft., in the northern part of the city, with the intention, it is understood, of erecting a plant for the manufacture of automobiles.

The Newton Beef Company, packer, has filed notice of an increase of capital stock from $15,000 to $100,000.

The Breed Mfg. Company, manufacturer of motor cycles, has purchased a factory site in Bay City, Mich., and will remove its plant from Detroit in the near future. The move is made with the idea of augmenting the capacity of the plant. G. W. Breed is president of the company.

The United Brass & Foundry Company has been incorporated with a capital stock of $10,000 The principal stockholders are Thomas Walburn, M. B. Walburn and William Brabant.

The Suburban Motor Car Company has been incorporated with a capital stock of $400,000. William J. Brown, J. R. Nostrand and J. N. Newman are the principal stockholders.

The Morton Motor Car Company has increased its capital stock from $5,000 to $10,000.

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The American Pattern Works has increased its capital stock from $2,000 to $10,000.

Muskegon, Mich., is to remodel its entire waterworks system at an expense of over $200,000. The new work will include a new intake pipe from Lake Michigan and a large number of new mains.

Fremont, Mich., is considering the establishment of a municipal water plant on the White River, 12 miles from Fremont. The estimated cost of the dam and machinery is $60,000.

The Peerless Wire Fence Company, Adrian, Mich., has a $20,000 addition to its plant in course of construction.

The Strable Mfg. Company, Saginaw, Mich., is planning the installation of a sprinkler system in its plant.

H. L. Hart will establish a pop-corn factory at Brooklyn, Mich. Machinery for husking, cleaning and packing corn will be required.

The Battle Creek, Coldwater & Southern Electric Railroad has found a market for its bonds and work will be started on the road in April. C. E. Wildey, of Burlington, is among those interested.

The Nichols & Shepard Company, Battle Creek, Mich,. manufacturer of farming machinery, will soon commence the erection of a large addition to its plant, which will more than double its capacity. A portion of the addition will be equipped for the manufacture of traction engines. The company reports an excellent volume of business.

Walter J. Woodman, of Portland, Me., has been appointed receiver of the National Boat & Engine Company. The company operates large plants at Muskegon and St. Joseph, Mich., which are known as the Racine Boat Company and the Truscott Boat Mfg. Company, respectively.

The American Fork & Hoe Company, Jackson, Mich., manufacturer of farming implements, has under construction an addition 60 x 96 ft., three stories, and has plans in hand for two other new buildings, one 100 x 230 ft., three stories, and the other 40 x 50 ft., two stories.

The Carpenter Spray Company has been organized at Grand Rapids, Mich., with a capital stock of $55,000, and will engage in the manufacture of spraying materials. E. C. Carpenter, St. Joseph, Mich., is at the head of the organization.

The Lansing Wheelbarrow Company, Lansing, Mich., has taken over the business of the Advance Concrete Mixer Company, Jackson, and will manufacture the product it formerly made.

The General Electric Company, Schenectady, N. Y., has been awarded the contract for the machinery to be installed in the municipal power plant at Marquette, Mich.

The taxpayers of Ubly, Mich., have voted in favor of bonding for the construction of a water works system.

It is reported that the United Woolen Mills Company, Chicago, will establish a woolen mill at Holland, Mich.

The Dielectrite Rubber Company, Muskegon, Mich., manufacturer of dielectrite insulation for high and low tension, is making extensions to its plant which will include the installation of tubing, shearing, grinding and buffing machines, punches, power saws, lathes, drill presses, transmission machinery and motors. The company, which is a new enterprise, reports an excellent volume of business and has been obliged to increase its capacity within the last six months.

The Grande Brick Company, Grand Rapids, Mich., is considering the doubling of its plant and the purchase of additional machinery.

Indianapolis

INDIANAPOLIS, IND., September 12, 1911.

The Magee Wiring Machine Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture sheet metal wiring machines. The directors are J. D. Williams, H. F. Hubbard and S. S. Broughton.

The Helfrich Pottery Company, Evansville, Ind., has been incorporated to manufacture pottery. The directors are A. Helfrich, M. D. Helfrich and H. F. Weaver.

The Ohio River Contract Company, Evansville, Ind., secured the contract for dam No. 48, on the Ohio River, six miles below Henderson, Ky. The bid was $1,400,000.

The M. Rumely Company, Laporte, Ind., last week shipped 5 cars of threshing machinery and tractors, in one train, to Regina, Canada.

The National Farm Device Company, Indianapolis, has been incorporated with $250,000 capital stock to manufacture graincleaning devices. The directors are J. M. White, George W. Benedict and A. J. Schoen.

The Stedman Foundry & Machine Company, Lawrenceburg, Ind., has sold its plant to the Baltimore & Southwestern Railroad Company, which will build on the site freight houses and warerooms. The Stedman Company will erect modern concrete buildings for a new foundry, to cost $25,000.

John Clark, formerly of the Clark Motor Car Company, Shelbyville, Ind., will become manager of a new automobile plant for a company now being organized.

The American Car Seal Company, South Bend, Ind., manufacturer of an automatic freight car seal, has begun operations.

Fire, September 4, destroyed the tipple and mine building at Diamond, Ind., belonging to J. H. McClelland, of Brazil, Ind., causing $5,000 loss.

The Maxwell-Briscoe Motor Company, Newcastle, Ind., after operating its plant on a 48-hour-a-week schedule during the hot weather, has resumed full time, full capacity, night and day shifts. The company will build 10,000 machines for the 1912 season.

The Home Electric Company, Wakarusa, Ind., has been incorporated with $15,000 capital stock, to supply heat, light and power. The directors are J. E. Gall, J. E. Bollenbacher and V. H. Schalliol.

The Ward Fence Company, formerly of Portland, Ind., has moved to Marion, Ind.

The Rushville Furniture Company, Rushville, Ind., is erecting a new factory. It will have its own electric power plant.

The Grocers' Chemical Works, Evansville, Ind., will erect a new plant, to cost $70,000.

The Dunkirk Cement, Tool & Machine Company, Dunkirk, Ind., has been incorporated with $10,000 capital stock, to manufacture tools and machinery. The directors are E. E. Gunkel, F. L. Hickman and J. R. Runner.

The South

LOUISVILLE, KY., September 12, 1911.

A disappointing lull has developed in the local machinery market, both in the number of inquiries and in the business actually being closed. Boiler manufacturers are doing less than they have been, but report that prospects for future business are still good. Manufacturers of ice machinery also state that there is a falling off in inquiries. Makers of special machines, such as dryers for brewery and distilling plants, report a heavy influx of business, and orders for this character of equipment are being received in sufficient volume to keep plants busy for a number of months.

The Louisville branch of the Standard Oil Company is rebuilding and enlarging its blacksmith shop at Fifth and Bloom streets.

Theodore H. Curtis, Louisville, former superintendent of machinery for the Louisville & Nashville Railroad, is patenting several devices for the perfection of which he resigned his position. Among them are an improved staybolt for locomotives and a staybolt for steam boilers.

The Brinly-Hardy Company, farm implement manufacturer, Louisville, has increased its capital stock from $160,000 to $210,000. The increase is for the purpose of taking care of the improvements which have been made recently in the plant.

The American Machine Company, Louisville, reports numerous orders for electrically operated freight and passenger elevators. It has been awarded a contract for nine elevators to be installed in the depot and office building of the Southern Railway at Atlanta.

The Columbia Steam Laundry, Louisville, will install new power equipment, including a 150 hp. boiler and a 50-75 hp. engine. E. X. Jackman is proprietor of the laundry.

The Henry Vogt Machine Company, Louisville, reports a falling off in inquiries for refrigerating and power machinery, but the plant is running full time on orders which have already been closed.

The Southern Brick & Tile Company, Louisville, has awarded a contract for a ditching machine to the Buckeye Traction Ditcher Company, Findlay, Ohio.

The Louisville Drying Machine Company reports enough orders ahead to keep the plant busy for several months. Brewing and distilling companies are the principal purchasers, although a good many machines are also being sold for the drying of alfalfa.

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W. J. Loughbridge, Lexington, Ky., has under consideration plans for the erection of an ice factory. This is the third project of the kind now under consideration at Lexington.

The Phoenix Hotel, Lexington, Ky., has awarded a contract to the Hatfield Electric Company, Indianapolis, for the installation of its power plant. Skinner engines and General Electric dynamos are to be used. The Triumph Ice Machine Company, Cincinnati, is installing the refrigerating plant.

The development of the coal deposits of western Kentucky is expected to proceed much more rapidly than heretofore. The increasing difficulty of getting Pittsburgh coal into Southern markets, compared with the facility with which the Kentucky product may be marketed in that section, has encouraged those owning coal lands in the western part of the Bluegrass State, and many new openings are being made.

The Luton Coal Company, Providence, Ky., is erecting a new tipple at its plant. In addition a good deal of mining machinery will be installed. An air compressor will also be purchased.

The Princeton Handle Company, Princeton, Ky., is contemplating the addition of wood-working machinery for finishing material. At present only the rough stock is manufactured. B. C. Crane is superintendent of the plant.

Thomas J. Mitchell, Uniontown, Pa., and others are organizing the Mitchell Coke Company for the purpose of constructing coke ovens near Hellier, Ky.

The Genuine Open Hearth Iron Metal Products Company, Newport, Ky., which was recently organized, will sell shop rights for a patent culvert and other metal products, according to recent announcement. A. L. Andrews, of the Newport Rolling Mill Company, is one of those interested in the new company, which was recently incorporated.

Barney & Sides, Rector, Ark., are equipping a plant for the manufacture of elm hoops at Hickman, Ky. They took over the plant and equipment of the Hickman Lumber & Planing Mill Company.

The Home Warehouse Company, Owensboro, Ky., plans the erection of a grain elevator to cost $15,000. A separate company will be formed for the purpose.

The Owensboro & Rockport Bridge & Terminal Company has been granted an extension of six months within which which to begin the work of constructing a bridge over the Ohio River between the points named.

The Park Carriage Company, Henderson, Ky., has announced plans for the erection of a three-story addition to its plant. It will be 25 x 100 ft., and will enable the company to increase its capacity considerably.

The Roberts Fluorspar & Lead Company, Marjon, Ky., has filed articles of incorporation. Its capitalization is $30,000, and the incorporators include George P. Roberts, William S. Ranson and Richard M. Lambert.

R. B. Starkweather and others, of Knoxville, Tenn., have purchased the plant and quarries of the Tegart Stone Company, Bowling Green, Ky., and are organizing the Victoria Limestone Company for the purpose of carrying on the business. The plant will be considerably enlarged and a mill for cutting stone to dimension will be equipped. It is probable that another opening will be made on the property.

The Hazard Bridge Company, Hazard, Ky., has filed articles of incorporation. The company is capitalized at $15,000, and the incorporators include Jesse Morgan, T. S. Ward and J. B. Hoge.

Clay City, Ky., acting with the county, is planning the construction of two bridges. It is expected that contracts will be let early in the fall, as it is desired that they be completed before winter.

The city of Owensboro, Ky., will shortly create a franchise for a gas company. The company now operating is expected to purchase the franchise and in this event it will probably make enlargements and otherwise improve its plant.

D. N. Young, of the Electric Dry Cleaning Company, Mt. Sterling, Ky., is having a power-house erected. The plant will be operated by electricity and motors and other equipment will be required.

W. T. Windell, Pikeville, Ky., is planning the erection of a large stave mill near that city. He has secured a considerable acreage of white oak timber and this will be worked up.

Jonesboro, Tenn., has decided by popular vote to issue $25,000 of bonds for the purpose of assisting in the construction of an electric line to Johnson City, Tenn.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., has installed new equipment for the purpose of enlarging the department devoted to the manufacture of skylights and window sash bars, galvanized gutters, roofing, etc. It is specializing in the manufacture of a metal shingle.

The Pinnacle Wagon Mfg. Company, Cincinnati, Ohio, is reported to be negotiating with the Board of Trade of Cumberland Gap, Tenn., relative to the establishment of a wagon factory there.

The Farmers' Union, Etowah, Tenn., is planning the erection of a cotton gin and flour mill. It will be located near the plant of the Etowah Ice Company, which will probably furnish the power for the operation of the new projects.

The Lakeview Traction Company, Memphis, Tenn., announces that it has closed contracts for $65,000 worth of equipment, completing the requirements of its power house. R. H. Bruce is chief engineer. The company will operate a traction line from Memphis to Lakeview.

The Maryville Electric Light, Heat & Power Company, Maryville, Tenn., which was recently organized with $100,000 capital stock, is proceeding with the plans for the construction of a hydroelectric plant at Abrams' Falls, 25 miles from Maryville.

The Richmond Hosiery Mills has purchased a building at Chattanooga, Tenn., and will equip it for the exclusive manufacture of bunting.

F. H. Angell will be in charge of the exhibit of the Jeffrey Mfg. Company, Columbus, Ohio, at the Appalachian exposition at Knoxville, Tenn. The exhibit will consist of pulverizing machinery for manufacturing limestone into fertilizer.

The Cullman, Ala., Light & Water Company, of which B. Kiel is superintendent, is receiving bids on the installation of an air compressor.

The Ashland Oil Mill & Fertilizer Company, Ashland, Ala., is in the market for a 175-hp. boiler. Address A. A. Northern. Second-hand equipment is preferred.

The Hughes Grate Shaker Company, Birmingham, Ala., has been incorporated with $300,000 capital stock by C. R. Atkins, J. G. Hughes and H. E. McCormick.

The Georgia Green Slate Company, Candler Building, Atlanta, is purchasing equipment for a slate quarry, and is in the market at present for channeling machines.

Two important fires in Alabama will probably require the purchase of new equipment by the concerns affected. The plant of the Southern Mfg. Company, Gadsden, Ala., was completely destroyed with $100,000 loss. It manufactured sash, doors and blinds. H. L. Gwin is secretary. The Armour Packing Company's packing and cold storage plant at Birmingham was also burned, the estimated loss being $200,000. The plant was completed only in July.

The Bryson Mountain Coal & Iron Company, Hartcraft, Tenn., is completing the erection of a new power plant.

As soon as negotiations looking to the purchase of the privately owned water works system by the municipality at Shreveport, La., are completed, steps will be taken to double the capacity of the plant.

J. R. Gilcrest, Toronto, Ohio, has purchased the controlling interest in the Davis-Price Foundry & Machnie Company, New Cumberland, W. Va. Machinery for clay-working plants will be especially manufactured.

The United States Porcelain Company, New Cumberland, W. Va., has closed its plant for the purpose of making repairs and installing additional machinery. The company manufactures high potential insulation.

Hain Mate, Huntington, W. Va., is organizing a company for the manufacture of a steel-back step-ladder.

The citizens of Lexington, Tenn., have voted to issue bonds for the installation of an electric light plant and water works.

The John A. McKay Mfg. Company, Dunn., N. C., has completed an extension to its machine shop and is now enlarging its foundry department, 30 x 150 ft., with one wing for core room, 30 x 30 ft. Orders have been placed for new machinery.

St. Louis

ST. LOUIS, MO., September 11, 1911.

The machine tool market continues to show a fair average of orders without any large contracts or inquiry lists. Dealers report a little improvement in the total

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as compared with recent weeks, and see signs of a better movement before the month is over. In general, however, the business is scarcely more than 65 per cent. of the normal condition previous to the dullness which has been continuing so long.

The Wrought Iron Range Company has let the contract for its new plant to be built on the northwestern edge of the city and to which it will remove as soon as the new buildings can be completed. The new structures will cost about $100,000, exclusive of the machinery plant, which will constitute by far the larger part of the total investment. All the buildings will be of fireproof construction, and are expected to be ready by March next.

The permit for the new building of the Matthews-Davis Tool Company, which has been issued, calls for a building to cost $18,000, exclusive of mechanical equipment. The plant will be utilized for the manufacture of an expansion boring tool.

The Bangor Zinc Mining & Smelting Company, St. Louis, has been incorporated with $30,000 capital stock, to operate in the Joplin field, by C. W. Dice, Gustave W. Robyn and John Ferris.

The Rudolph Mfg. Company, Roselle, Ill., has been incorporated, with $25,000 capital stock, by H. J. Mensching, R. H. Rudolph and L. A. Mensching.

The Missouri Belting Company has bought a new site for its plant, and will build and equip for much larger output than it has at present.

The Cronk & Foster Engraving Company, Little Rock, Ark., has been incorporated, with $35,000 capital stock, by Edward Cronk, Frank Foster and A. Foster, and will equip a plant for the engraving business.

The Beecher Light & Power Company, Beecher, Ill., has been incorporated to establish a public lighting system by Henry B. Ruge, William J. Hinds and Carl Ehrhardt.

The William J. Lemp Brewing Company has taken out a permit for the erection of an addition to its brewing plant to cost $78,000, exclusive of its mechanical equipment. The building will be seven stories and fireproof.

The city of Springfield, Mo., has voted to hold an election on the proposed issue of $600,000 of bonds for the purchase of machinery and the installation of a municipal water plant. It will also vote at the same time on the establishment of a $100,000 septic system for the handling of its sewage. The plan contemplated makes no provision for the acquisition of the present privately owned system.

The Monmouth Creamery Company, Monmouth, Ill., has been incorporated and will equip a plant for the handling of and manufacture of dairy products.

The Ross-Frazier Iron Company, St. Joseph, Mo., has been incorporated, with $100,000 capital stock, by John A. Ross, Jacob M. Ford, Charles A. Frazier and others.

The Wyco Car Company, St. Joseph, Mo., has been incorporated with $50,000 capital stock, for the manufacture of motor cars, by Huston Wyatt, G. N. Johnson and J. E. Eberly.

The Dorris Motor Car Company, St. Louis, Mo., has announced plans for the erection of a three-story reinforced concrete automobile factory to cost $100,000. It is intended that construction will begin within 30 days.

Texas

AUSTIN, TEXAS, September 9, 1911.

A general improvement is noted in the demand for machinery in Texas as well as in the Southwest and Mexico. Much attention is being given to the installation of mills and machinery for mines, particularly in Arizona and New Mexico. What is considered a remarkable demand for irrigation pumping machinery exists in the shallow water belts of western Texas and New Mexico, where many individual pumping plants have been installed during the last few months. This development movement has just been started, the discovery that a sufficient supply for irrigating considerable areas of land may be obtained by putting down shallow wells being comparatively new. It is expected that the good demand that already comes from those sections for pumping machinery will be wonderfully increased from now on.

The Laredo Water Works Company, Laredo, will install a large amount of new machinery in its plant, enlarging the capacity and making other improvements.

The Commercial Club of Kingsville, Texas, is promoting the establishment of a large creamery. It is proposed to organize a local company for the purpose.

The Temple Gas Company, Temple, is preparing to rehabilitate its plant. It will purchase considerable new machinery and relay the mains of its distributing system.

W. L. Swinney and associates are installing stone cutting and dressing machinery in their quarry near San Saba.

The Rio Grande Development Company has been formed at Houston for the purpose of constructing a system of irrigation in the lower Rio Grande valley. The capital stock is $10,000. Incorporators are L. M. Matthews, W. G. Buckner and T E. Cowart.

Bids for the construction of a drainage system to embrace 85,000 acres near Brownsville were opened August 30 by the drainage commission, but all were rejected owing to the failure of the bidders to comply with certain legal requirements. A new date, October 3, was set for receiving new bids. Bonds to the amount of $204,500 were recently issued by the district to pay for the proposed drainage work.

T. H. Zanderson of San Antonio, Walter Avant of Jordontown and associates will build a water works plant and distributing system at Jordontown, Texas, at a cost of about $15,000.

The Byrd Land & Cattle Company will construct a large system of irrigation on Turkey Creek near Uvalde. The plans involve the dredging of a canal from the Nueces River to Turkey Creek, a distance of nine miles. A reinforced concrete dam will be built across Turkey Creek and a reservoir formed that will cover about 5000 acres. It is estimated that the water supply will be sufficient to irrigate about 60,000 acres. The surveys for the project are now being made.

The Business League of Bay City is promoting the establishment of creamery. M. Thompson, O. J. Doubeck and B. E Norvell have charge of the matter

R. P. Smythe of Plainview and associates are promoting the establishment there of a beet sugar factory to cost about $600,000. Practical sugar manufacturers are interested in the proposition. Tests have been made of the land of that section for growing sugar beets and it is found that the industry can be made a success.

The Marley Gin Company, Reisel, has been formed with a capital stock of $6500. The incorporators are W. M. Marley, J. A. Smith and F. M. Miller.

The Munger Automobile Company, Dallas, has been formed with a capital stock of $25,000. The incorporators are S. I. Munger, L. R. Munger and S. I. Munger, Jr.

Wesley Merritt of Chicago has purchased several blocks of ground at Port Bolivar, including a good water frontage, as a preliminary step in what is asserted to be the establishment of blast furnaces for utilizing East Texas iron ore. The East Texas Iron Ore Mining & Development Company is also reported to have adopted plans for the establishment of furnaces at Port Bolivar.

The Pacific Coast

SAN FRANCISCO, September 5, 1911.

Scarcely an inquiry for large machine tools has been experienced for several weeks, and nothing is in prospect which offers much encouragement for the immediate future. Some of the local merchants look for more activity after the municipal election, but others feel that business is not likely to be resumed on any large scale for at least a year. The railroads are buying practically nothing, and while they have asked for prices on a few tools, they are not expected to enter the market actively before next year. Much will depend on the developments of the next few weeks in the relations of the railroads with their shop employees.

It is reported that the Westinghouse Air Brake Company and the Oliver Chilled Plow Company will establish plants at Emeryville and Richmond, Cal., in the near future, but the best that is expected in this connection is the sale of a few small machines. A good many orders for single tools of small size are coming from automobile repair shops and other small concerns through the country, keeping this class of trade about up to the recent average.

Mining machinery continues active in a small way, with a fair amount of inquiry for stamp mills, crushers, etc., of a fairly large nature. Nothing is being done in the line of heavy rock crushers, as many of the plants already established are idle. Small crushers, however, are wanted by many counties and towns, and all lines of

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road-building machinery are moving well. The recent movement of sawmill machinery has been very satisfactory for this time of year, and many new projects are coming up which will require mill and logging equipment within a few months. Some large orders are coming out for electrical equipment. Numerous improvements are being made in brick plants, both around San Francisco and in southern California. The demand for power pumps is of about the same volume and nature as for some time past.

The Southern Sierras Power Company has placed orders for a lot of equipment to be installed at San Bernardino, Cal., C. C. Moore & Co. getting the contract for the installation of the steam generating plant, which will amount to about $200,000. The contract for steel transmission towers has been placed with Milliken Bros., Inc.

The Great Western Cutting & Welding Company, San Francisco, has been incorporated with a capital stock of $200,000, By O. L. Berry, M. J. Kuhl and E. B. Folsom.

The American Gas Engine Company has started work on its shop at Ventura, Cal. Gas engines of from 5 to 45 hp. will be made.

The C. L. Best Gas Traction Company, Oakland, Cal., is building an addition to its steel foundry. A 10-ton electric crane will be installed. In addition to traction engines the company is now manufacturing electric harvesters.

Preliminary plans are being made for the shops of the Geary Street Municipal Railroad, for which several machine tools will be required.

The Los Angeles Pressed Brick Company, whose large paving brick plant at Santa Monica, Cal., was destroyed by fire last month, will rebuild as soon as plans can be completed.

The Irrigators' Supply Company, controlled by the same interests as the Pacific Electric Heating Company, intends to start a factory at Ontario, Cal., for the manufacture of metal goods used in irrigation.

Specifications have been completed for the main power equipment of the San Francisquito No. 1 plant of the city of Los Angeles have been completed, and bids will be taken at an early date. The equipment will include generators, water wheels and transformers, the estimated cost being about $350,000.

The Crow Mfg. Company has taken an order for a pumping plant for the city of San Bernardino, Cal.

Samuel Livingston of Oakland and F. Deutsch of this city have formed a partnership under the name of the Western Machinery Company.

The Main Street Iron Works, this city, is building the engine for a new steamer, the hull of which has just been completed at Eureka, Cal.

The Gorham Engineering Company, Oakland, Cal., is building hulls and engines for two 100 hp. gasoline boats for Seattle parties.

The State Harbor Commissioners have awarded to the Moore & Scott Iron Works a contract for repairing steel dredge buckets by the electric welding process.

A meeting of the stockholders of Baker & Hamilton, hardware and steel merchants, San Francisco, has been called for October 26, for the purpose of considering an increase of the capital stock from $1,000,000 to $2,000,000.

The Clive Arms & Mfg. Company, A. A. Clive president, has been organized at Los Angeles, with the intention of building a plant for the manufacture of firearms.

The Trinity River Gold Mining & Reduction Company is arranging to add ten stamps to the ore mill at the Headlight mine, Trinity Center, Cal. The company is also considering the installation of a dredge on Trinity River.

The Fruit Growers' Supply Company will double the capacity of its sawmill at Hilt, Cal., during the winter. Additional logging equipment will also be required.

A meeting of the creditors of the A. T. Ames Mfg. Company, pump manufacturer, Niles, Cal., was held August 30.

An attachment has been filed on the property of the Goldy Machinery Company, Sunnyvale, Cal., in the interest of H. L. Atkinson of New Jersey.

The Western Machine & Foundry Company, Santa Barbara, Cal., will shortly erect two buildings, to house a cupola and automobile shop.

The Riverside Portland Cement Company, Riverside, Cal., has installed a 15-ton crane, purchased from the Brown Hoisting Machinery Company.

Bids will be opened by the Board of Public Works of this city, September 20 for machinery, etc., for the San Francisco Hospital, the estimated cost of which is about $100,000. Over half the expenditure will be for power house equipment, including steam turbines, and most of the remainder for laundry and refrigerating plants.

The Pacific Navigation Company is planning to install a large laundry plant at San Pedro, Cal.

The Feather River Mill Company, operating near Portola, Cal., has placed orders for a new band saw and several other machines.

The Seattle Frog & Switch Company, Seattle, Wash., will move its plant to Earlington, Wash., along the line of the Chicago, Milwaukee & Puget Sound Railroad. The company has purchased five acres of land at Earlington, on which is to be erected a general manufacturing building, 100 x 200 ft., which will enable the company to increase its present output about 50 per cent.

The Portland Railway Light & Power Company, Portland, Ore., has begun the erection of a car building plant, the building and equipment of which are expected to cost several hundred thousand dollars.

Government Purchases

WASHINGTON, D. C., September 11, 1911.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids under schedule 3887 September 19 for five engine lathes and 19 motors for machine tools, schedule 3888, and on September 30 for two 15-ton locomotive jib cranes, one to be delivered to navy yard, Norfolk, Va., and one to Mare Island Navy Yard.

The United States Engineers' office, Wheeling, W. Va., will open bids September 22 for constructing and delivering steel hull dipper dredge Col. M. B. Adams, with machinery, fittings, etc.

The superintendent of prisons, Department of Justice, Washington, will open bids September 18 for one air compressor, air receiver, riveting hammers and a quantity of hose for use with the hammers.

The Navy Department, Washington, will open bids September 19 under schedule 3887, class 131, for five Hendy-Norton engine lathes for the Newport Navy Yard, and under schedule 3888, class 141, motor applications to belt-driven machine tools for the Brooklyn Navy Yard.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until September 30 for a portable air compressor and accessories for the navy yard at Norfolk, Va.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened the following bids September 5:

Schedule 3803, class 1, one motor-driven extension base—Bidder 75, Harron, Ricard & McCone, San Francisco, Cal., $941; 85, Kemp Machinery Company, Baltimore, Md., $978; 135, Rix Compressed Air & Drill Company, San Francisco, Cal., $718, $745 and $790; 226, Manning, Maxwell & Moore, New York, $735 and $829; 245, Springfield Machine Tool Company, Springfield, Ohio, $1,051.

Class 2, one motor-driven back-geared power feed drill press—Bidder 2, Atlantic Creosoting & Wood Preserving Works, Norfolk, Va., $580; 85, Kemp Machinery Company, Baltimore, Md., $473.50, $422 and $489; 135, Rix Compressed Air & Drill Company, San Francisco, Cal., $574; 226, Manning, Maxwell & Moore, New York, $815 and $560; 271, Pacific Tool & Supply Company, San Francisco, $550.

Class 3, one motor-driven two-wheel emery grinder with two spare wheels—Bidder 85, Kemp Machinery Company, Baltimore, Md., $259; 199, James Clark, Jr., Electrical Company, Louisville, Ky., $240; 226, Manning, Maxwell & Moore, New York, $990 and $885; 241, Springfield Mfg. Company, Bridgeport, Conn., informal.

Class 4, one motor-driven sensitive drill—Bidder 199, James Clark, Jr., Electrical Company, Louisville, Ky., $160; 226, Manning, Maxwell & Moore, New York, $274.

Class 5, one screw-cutting back-geared motor-driven tool room lathe—Bidder 75, Harron, Ricard & McCone, San Francisco, Cal., $772 and $1,105; 135, Rix Compressed Air & Drill Company, San Francisco, Cal., $1,104 and $1,154; 204, Eccles & Smith Company, San Francisco, Cal., $1,338; 226, Manning, Maxwell & Moore, New York, $1,350; 228, Niles-Bement-Pond Company, New York, $1,241; 233, O. L. Packard Machinery Works, Milwaukee, Wis., $1,027; 271, Pacific Tool & Supply Company, San Francisco, Cal., $1,475.

Class 6, one back-geared motor-driven extension gap lathe—Bidder 75, Harron, Ricard & McCone, San Francisco, Cal., $2,302; 85, Kent Machinery Company, Baltimore, Md., $2,403, $2 257; 204, Eccles & Smith Company, San Francisco, Cal., $3,835; 226, Manning, Maxwell & Moore, New York, $1,725 and $2,365; 228, Niles-Bement-Pond Company, New York, $3,271; 233, O. L. Packard Machinery Works, Milwaukee, Wis., $2,330; 271, Pacific Tool & Supply Company, San Francisco, Cal., $2,850.

Schedule 3833, class 21, 20 sets steam turbine-driven blowers—Bidder 63, General Electric Company, Schenectady, N. Y., $1,000; 83, Kerr Turbine Company, Wellsville, N. Y., $967.50; 165, Terry Steam Turbine Company, New York, $1,075 and $912.50; 172, Westinghouse Machine Company, East Pittsburgh, Pa., $1,100; 246, B. F. Sturtevant Company, Hyde Park, Mass., $1,059 and $944; 249 Turbine Equipment Company, Philadelphia, Pa., $1,045 and $1,145.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square.... ℔ 1.70¢
1⅛ to 4 in. x ⅜ to 1 in.....
1½ to 4 in. x ¼ to 5-1 ..... ℔ 1.80¢
Rods—⅜ and 11-16 round and square. ℔ 1.80¢
Angles: Cts. ℔ lb.
3 in. x ¼ in. and larger.....1.90¢
3 in. x 3-16 in. and ⅛ in.....2.30¢
1½ to 2½ in. x ⅛ in.....2.05¢
1½ to 2½ in. x 3-16 in. and thicker....1.95¢
1 to 1¼ in. x 3-16 in.....2.05¢
1 to 1¼ x ⅛ in.....2.10¢
⅞ x ⅛ in. .....2.20¢
⅝ x ⅛ in. .....2.25¢
⅞ in. x ⅛ in.....3.45¢
½ x 3-32 in. .....3.90¢
Tees:
1 in. .....2.35¢
1¼ in. .....2.20¢
1½ to 2½ x ¼ in.....2.00¢
1½ to 2½ x 3-16 in.....2.10¢
3 in. and larger.....2.95¢
Beams .....1.90¢
Channels, 3 in. and larger.....1.90¢
Bands—1¼ to 6 x 6-16 to No. 8.....2.10¢
Burden's "H. B. & S." iron, base price....2.95¢
"Burden's Best" iron, base price.....3.15¢
Norway bars .....3.60¢

Merchant Steel from Store—

per ℔
Bessemer machinery.....1.90¢
Toe calk, tire and sleigh shoe.....2.50@3.00¢
Best cast steel, base price in small lots.....7¢

Sheets from Store—

Black

	One pass, C.R. soft steel.	R. G. cleaned.
No. 16.....	℔ 2.45¢	2.75¢
Nos. 18 to 20.....	℔ 2.50¢	2.85¢
Nos. 22 and 24.....	℔ 2.55¢	2.95¢
No. 26.....	℔ 2.60¢	3.05¢
No. 28.....	℔ 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment .....℔ 12 @14½
Patent planished, W. Dewees Wood.....℔ A, 10¢: B, 9¢ net

Galvanized

Nos. 12 and 14.....℔ 2.75¢
No. 24 .....℔ 3.10¢
No. 26.....℔ 3.30¢
No. 28.....℔ 3.60¢

No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos 22 and 24.....℔ 5.50¢
No. 26.....℔ 6.00¢
No. 28.....℔ 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24..... ℔ 100 sq. ft.	$3.75	$4.70
No. 26..... ℔ 100 sq. ft.	2.85	3.90
No. 28..... ℔ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:
IC, 14 x 20.....$6.65
IX, 14 x 20..... 7.90
A. charcoal:
IC, 14 x 20.....$5.60
IX, 14 x 20..... 5.70

American Coke Plates—Bessemer—
IC, 14 x 20.....107 lb.....$4.50
IX, 14 x 20..... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating.....$8.70
IX, 20 x 28 with an 8 lb. coating.....10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ℔

High Brass Rods—

List February 1, 1911. 14⅜¢ ℔

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ℔

Brass Wire—

List February 1, 1911. 14⅜¢ ℔

Copper Wire—

Base price, Carload lots mill 13¾¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) .....℔ 17¢
Sheet copper cold rolled, 1¢ ℔ advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ℔ square foot.
Sheet copper polished over 20 in. wide, 2¢ ℔ square foot.
Planished copper, 1¢ ℔ square foot more than polished.

METALS—

Tin—

Straits pig .....℔ lb 46 @47 ¢

Copper—

Lake ingot .....℔ lb 14 @14⅛¢
Electrolytic .....℔ lb 13¾@14 ¢
Casting .....℔ lb 13¾@14 ¢

Spelter—

Western .....℔ lb 6¾@ 7⅛¢

Zinc—

No. 9, base, casks...℔ lb 8⅛¢ Open...℔ lb 8¢

Lead—

American pig .....℔ lb 5¼@5½¢
Bar .....℔ lb 6⅜@6¾¢

Solder—

½ & ½, guaranteed.....℔ lb 28¼@28¾¢
No. 1 .....℔ lb 26½@26¾¢
Refined .....℔ lb 24¾@25¼¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson .....℔ lb..@10¼¢
Hallets .....@10 ¢
Other brands .....9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting.....21¢ and 22¢
Rods and Wire.....Base price 31¢
Sheets .....Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

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Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

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